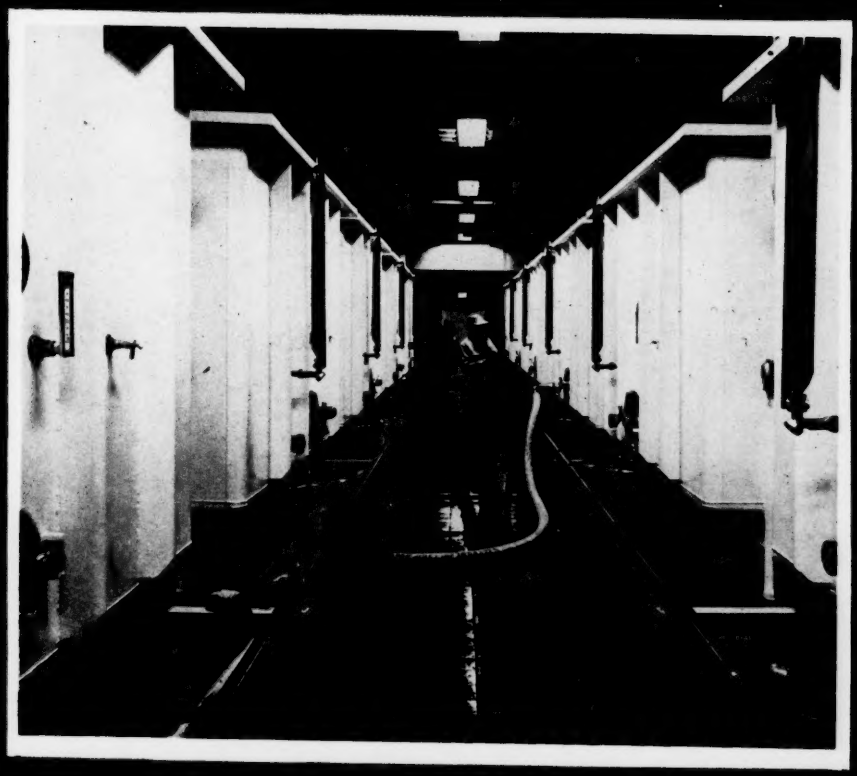
ICE and REFRIGERATION

THE NATIO
INDUSTRIAL



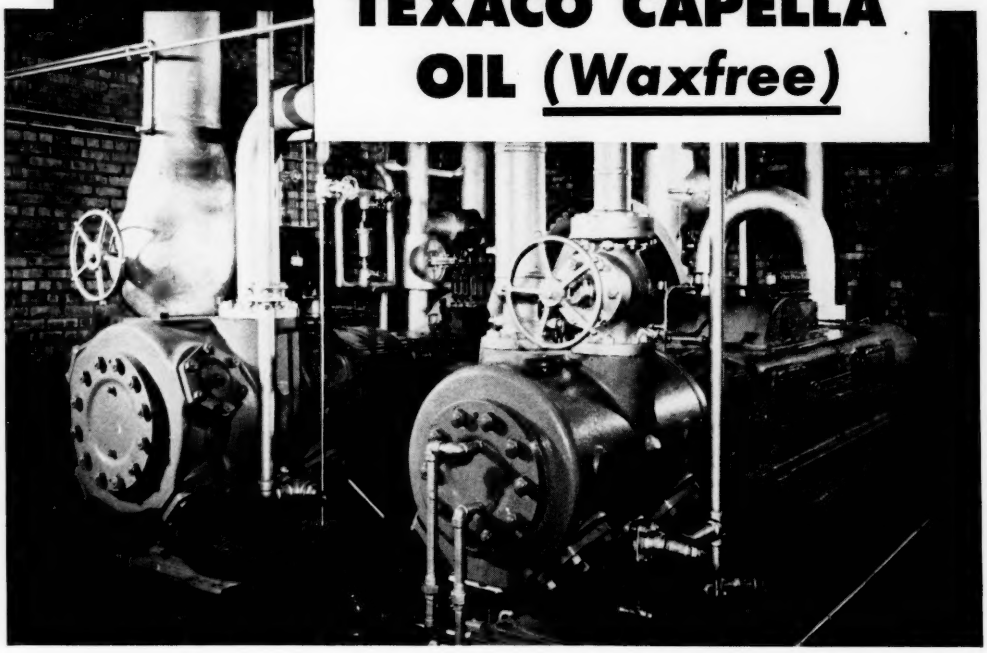
Air Purification in Fruit Storage..... Page 13

JULY • 1952

Pacific States Warehousemen's Convention ..... Page 30

Use the oil that WON'T FORM WAX

TEXACO CAPELLA OIL *(Waxfree)*



IN *any* compressor, with *any* refrigerant, at *any* temperature down to minus 100°F., *Texaco Capella Oil (Waxfree)* assures clean, efficient operation and freedom from wax precipitation. It's your best bet for both normal refrigeration and ultra-low temperature service.

Texaco Capella Oil (Waxfree) has haze and floc temperatures that are outstandingly low. It's a highly refined oil, with notable resistance to oxidation and freedom from moisture. It will not react with refrigerants.

There is a complete line of these new and improved *Texaco Capella Oils (Waxfree)*—one to meet the requirements of every refrigerating job. They come in *refinery-sealed* containers—55-gallon drums, and make-up cans of 5-gallon, 1-gallon and 1-quart size.

Let a Texaco Lubrication Engineer help you step up refrigerating efficiency and bring down your maintenance costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO Capella Oils (Waxfree)

FOR ALL REFRIGERATING AND AIR CONDITIONING EQUIPMENT

Faithfully yours 50 *for Fifty Years*

new "X-TYPE" doors

MOST REVOLUTIONARY ADVANCEMENT IN THE COLD STORAGE DOOR INDUSTRY!

Advantages of "Butcher Boy" NEW "X-TYPE" Construction:

1. "X-Type" Steel Diagonal Bracing is the basic principal of RIGIDITY.
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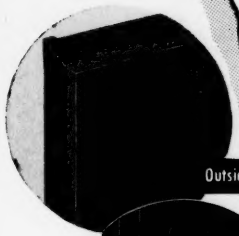
3. The only POSITIVE method to prevent door sagging.
4. Allows REVERSAL OF DOOR SWING if necessary.

The Strongest and Most Durable Cold Storage Door Built!



Outside Corner Construction

Inside Corner Construction

"INTERLOK" NO-SAG CORNER CONSTRUCTION

(Pat. Pend.)

No other cold storage door company can offer the exclusive features of "X-Type" Steel Bracing and "Interlok" No-Sag door construction . . . Specify these features . . . They cost no more.

ALL BUTCHER BOY DOORS ARE BUILT "X-TYPE"

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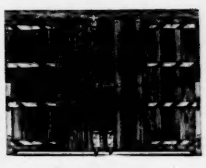
Track Door



Double Door

Vestibule Door

Low Temp. Door

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Write Today for New Catalog

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Please send me your new catalog on Butcher Boy "X-Type" doors

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16 MILES OF BYERS WROUGHT IRON PIPE SAFEGUARDS WOLLMAN MEMORIAL SKATING RINK

In Wollman Memorial Rink, world's largest outdoor artificial skating rink, more than 80,000 feet of 1¼ inch Byers Wrought Iron pipe, laid 4" center to center, were embedded in a 28,000 sq. ft. expanse of monolithic concrete skating area. The refrigeration system includes three York 11½" x 10" vertical, single acting two cylinder compressors, capable of producing a total of 300 tons of refrigeration. The rink, designed in accordance with the Carpenter Patents, operates from October to April.

Architect on the project was Amar Embury II. George B. Post & Sons were consulting engineers for the rink and Sears and Kopf were engineering consultants for the mechanical and electrical work. The American Carbonic Engineering Company was awarded the refrigeration contract. All work was done under the supervision of the city's Department of Parks, Robert Moses, Commissioner.

Genuine wrought iron pipe has proved its superior durability, over and over again, in rinks throughout the country. Its excellent forming and welding properties, and its established high resistance to corrosion are responsible for this widespread acceptance.

Our bulletin, WROUGHT IRON IN REFRIGERATION AND AIR CONDITIONING SYSTEMS, illustrates and describes several installations. Write for your copy.

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Why Genuine Wrought Iron Lasts

This notch-fracture test specimen illustrates the unique fibrous structure of genuine wrought iron—which is responsible for the high corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

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WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

ICE and Refrigeration

VOLUME 123 NUMBER 1

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July, 1952

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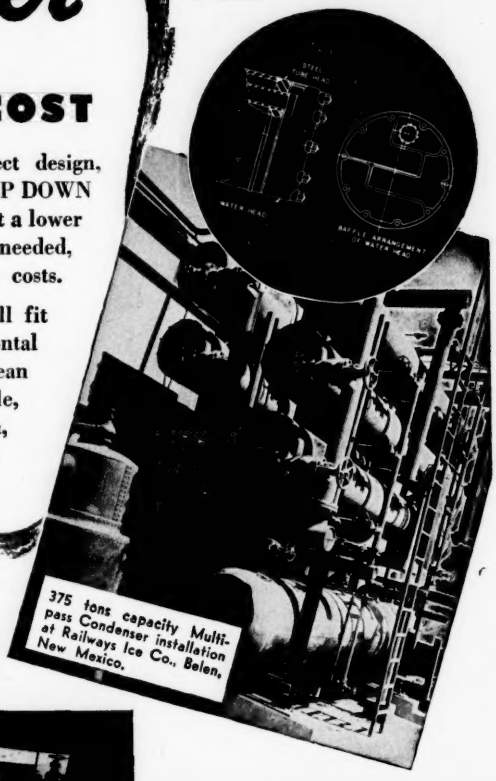
$ave Power and REFRIGERATION COST

Vogt Condensers, because of their correct design, STEP UP the rate of heat transfer and STEP DOWN head pressures. With the liquid delivered at a lower temperature, smaller compressor capacity is needed, saving in original as well as operating costs.

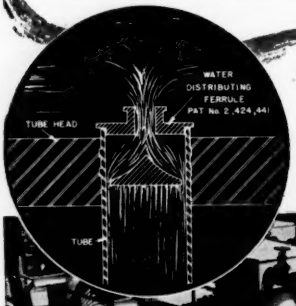
One of the two basic types illustrated will fit your operations exactly. Install Horizontal Multipass (closed type) for use with clean waters. Where the water is hard, forms scale, contains mud or promotes fungus growth, Vertical Single Pass (film type) which can be cleaned in operation, are recommended.

Horizontal Multipass Condensers
(Closed Type)

Water circulated in tubes traverses the length of the unit a number of times as determined by baffles in the heads.

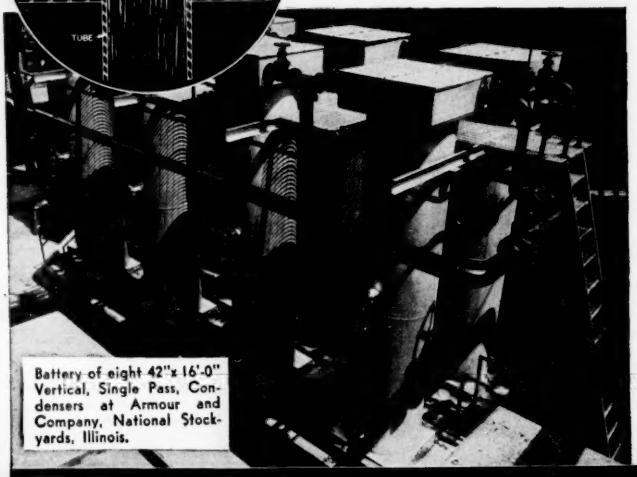


375 tons capacity Multipass Condenser installation at Railways Ice Co., Belen, New Mexico.



Vertical Single Pass Condensers
(Film Type)

Patented ferrules give equal distribution of water to and over the surfaces of all tubes in a unit.



Battery of eight 42"x 16'-0" Vertical, Single Pass, Condensers at Armour and Company, National Stockyards, Illinois.

HORIZONTAL and VERTICAL TYPES SHELL and TUBE CONDENSERS For Every Service

Write For Bulletin RC-1

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Branch Offices: NEW YORK, CHICAGO, CLEVELAND, DALLAS, PHILADELPHIA, ST. LOUIS, CHARLESTON, W. VA.

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FOR HALF THE USUAL COST
FULL ELECTRIC FORK TRUCK OPERATION

from LEWIS-SHEPARD

LEWIS-SHEPARD took a need and built this truck around it!

For cramped areas: right angle stacks in 8' aisles.

For limited floor load capacities: weighs 2500 to 3000 lbs. W/O battery.

For rugged duty: All welded construction, full gear drive.

And because of Lewis-Shepard's unique One Design Line it can be priced lower than any other electric fork truck

Persistent repeat orders from scores of blue ribbon companies are the very best proof that the "J" will give you all these money saving features . . .
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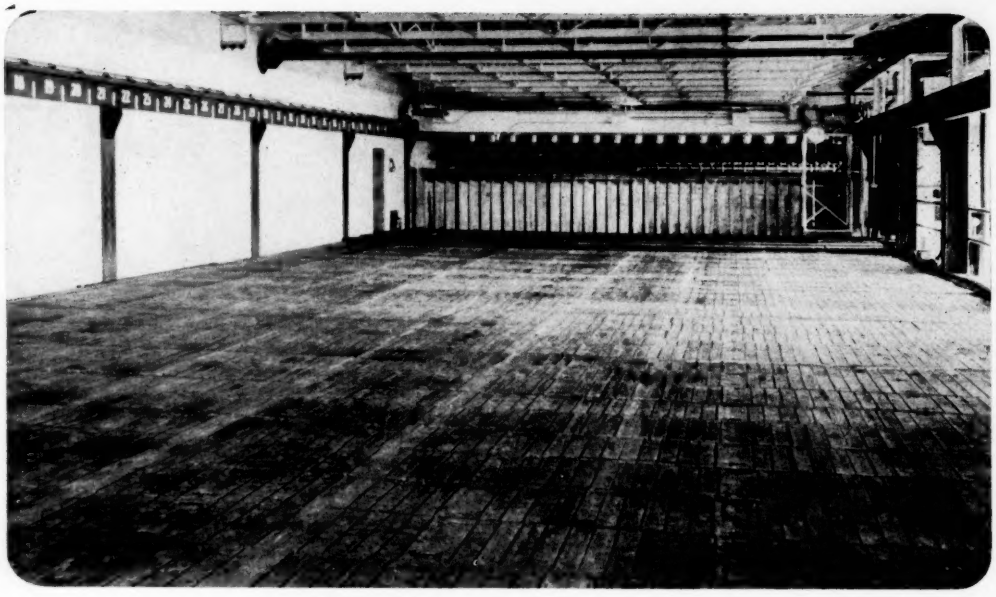


FRICK

Genuine Oak Ice-Can Covers, Boiled in Linseed Oil

Standard Frick Covers are Made for One or Two Cans

Using selected, seasoned wood, these covers are made with the right spacing between boards to keep them flat in service. Waterproof tar paper is between the layers, which are secured with drive screws; lifting eyes are made oversize. Furnished for one, two, three or four cans. None better. Get yours now, whether needed for a new plant or for replacements.

Write to

DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

WAYNESBORO, PENNA. U.S.A.

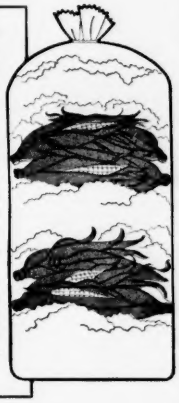
A *New* MARKET FOR THE ICE INDUSTRY...

GROWERS OF SWEET CORN

USE 20 LBS. OF ICE PER BAG TO SHIP CORN TO MARKET IN NEW ICED SWEET CORN BAG

Easy wire fastening (or may be stapled) • Three layers of sturdy, wet-strength kraft paper • Dependable wet-strength protection against breakages • Attractive printing on front • Big capacity: 20 lbs. of ice, five dozen ears in 20" x 39" x 7" bag • Comes printed in green, as illustrated • Ice in bags is reusable. For example, for counter refrigeration • Perforations provide drainage for melted ice water • "Satchel bottom" construction for convenient standing and filling • Guaranteed to cut deterioration and waste

TWO LAYERS OF CORN are inserted in the bag between three layers of ice. The ice is mixed, fine and coarse, for quick cooling and longer-lasting refrigeration.



SUCCESSFULLY market-tested last year, the new Union Iced Sweet Corn Bag has proved its value to the produce industry in protecting the flavor, freshness and appearance of corn en route to market.

Growers of sweet corn represent an important new sales target for you. Potentially they are a market for over 200,000 tons of crushed ice annually.

Many growers already are familiar with the new Iced Sweet Corn Bag. Others rapidly are becoming acquainted with it through recommendation by government and farm agencies, as well as through Union Bag advertising.

You are a logical supplier not only of the ice needed for these bags—20 lbs. per sack—but also the bags themselves. Get in on the ground floor. Many companies already are sending in substantial orders for Iced Sweet Corn Bags, to be included in their regular Iced Bag cars.

UNION ICED SWEET CORN BAGS

UNION BAG & PAPER CORPORATION

WOOLWORTH BUILDING, NEW YORK 7, NEW YORK

MAIL COUPON FOR FREE SAMPLES

Union Bag & Paper Corporation
Woolworth Building, New York 7, N. Y.

Please send samples and more information about the new Iced Sweet Corn Bag and the sales opportunities it presents for crushed ice.

Name & Title_____

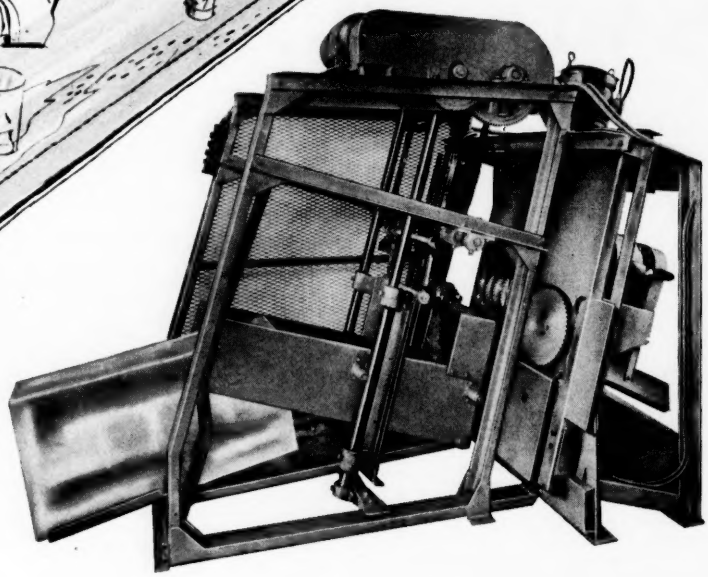
Company_____

Address_____

City_____ State_____

26,000
H. P. H.*

* Highballs per Hour: Using one cube per glass, it would take 73 bartenders—working full time at ten seconds per drink—to keep up with the output of this G-W super-cuber.



Completely automatic, this Gifford-Wood Type A Cuber shoots out perfect ice cubes at the rate of 26,000 per hour and minimizes ice waste. It accommodates a 300- to 400-pound cake which is held firm on the loading plate, aligned with the precision cutting saws. And, as soon as this first cake is ¾ cut, a second cake slides easily into place pushing the remaining quarter into the saws. This means no waste—every piece of ice is saleable. There's a further benefit, too—all parts coming in contact with the ice are not only sturdy, but completely corrosion-proof—your guarantee of minimum maintenance cost. For full information, write for Bulletin 488.

GIFFORD-WOOD CO.

Since 1814

HUDSON, N. Y.

New York 17, 420 Lexington Avenue — St. Louis 1, Railway Exchange Bldg. — Chicago 6, 565 W. Washington St.

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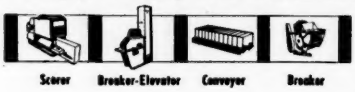


Scorer — Breaker-Elevator — Conveyor — Breaker

9428

How to make better ice . . . FASTER!

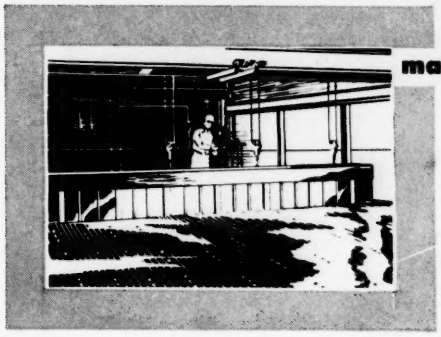
templets

the little green tablets that make ice clearer!

With TEMPLETS, the original ice-tempering tablets, you can make more ice during the peak summer months in the same number of cans. TEMPLETS reduce cracking and breaking in the cakes, so you can freeze raw water at lower brine tank temperatures, use the cans more often and make more ice!

Besides making your ice tougher and reducing its tendency to break or crack during cutting or scoring, TEMPLETS also give you a clearer cake. White butts, heavy cores and the cloudy veil that your customers don't like can be completely or partially eliminated by using TEMPLETS. They clear your ice of imperfections caused by hard raw water. And the TEMPLETS treatment costs about 1c a ton!

TEMPLETS are the famous green tablets that have been in use for years in ice plants all over the world. Two or three TEMPLETS dissolved in a can, improve the quality of your ice and leave no taste, no odor, no color. Try the TEMPLETS treatment today — at our expense!



make this test in your own plant — FREE!

1. **Send the coupon below for your free sample of TEMPLETS.**
2. **Dissolve two or three TEMPLETS in each can of raw water in alternate rows of cans.**
3. **Carefully check the quality of the ice made with TEMPLETS against that made without them. Test the strength of the ice made with TEMPLETS. Notice its clearness. You'll find that the ice made in the cans with TEMPLETS is clearer, stronger, better ice than that made in the cans where no TEMPLETS were used.**

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Company.....

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ALCO VALVES help refrigeration systems operate at peak efficiency. They keep produce, meats and dairy foods "just right" for the chef's approval.

ALCO 402 TYPE – miniature, universal valve for display cases, deep freezers, milk coolers, blower coils. Pressure limiting for motor protection. Easy to install and service.

ALCO MULTI-OUTLET THERMO VALVES – assures equal distribution of refrigerant on multiple circuit systems. For all refrigerants and applications: ½ to 50 tons "Freon-12", 2 to 36 outlets.

ALCO "T" SERIES – easy to service on the line. Comes apart in three simple steps. External superheat adjustment. For all temperatures and all refrigerants: ½ to 50 tons "F-12".

ALCO SOLENOIDS – tight-seating; give accurate temperature control.

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Designers and Manufacturers of Thermostatic Expansion Valves; Evaporator Pressure Regulators; Solenoid Valves; Float Valves; Float Switches.

5208

In The Spotlight

AIR PURIFICATION of fruit storage rooms is a controversial subject on which there is conflilcting information. The articlle on page 13 brings together a summary of this information.

A ST. LOUIS FISH company, urged on by an expanding business has added a refrigerated storage and freezing department. The story of this company's growth and a description of the storage and freezing facilities is told in the article starting on page 19.

A TEXAS ICE company operates a retail business through 136 vending units in 24 ice plants and 15 vending stations. Pointers on this class of business are given on page 25.

LOW PRODUCTION volume with consequent higher prices per ton is a problem which affects many ice producers. How an Indiana ice manufacturer tackled this problem and won, is told in the article on page 26.

THE PACIFIC STATES Cold Storage Warehousemen's Association held its 30th annual convention April 14-16. Chief topics discussed were warehouse receipts, research, and the California Public Utilities Commission. Report starts on page 30.

A PORTABLE mechanical lift for high-piling and breaking out high-piled boxes of apples has been constructed by the Research Department of the Washington State Apple Commission. The device is described and illustrated in article on page 34.

SEVERAL METHODS may be employed by the operating engineer to adapt the compressors and evaporators in an air conditioning plant to reduced loads. This is outlined briefly by Prof. Venemann on page 39.

COVER: Some of the settling tanks in Falstaff Brewing Corporation's New Orleans plant which has equipment to produce 1000 tons of refrigeration a day to cool cellars such as the one in which these tanks are located. See story on page 18.

A COOLING LOAD estimate form, with instructions, has been prepared for members of the Self Contained Air Conditioner Section of the Air Conditioning and Refrigeration Machinery Association. This form, with its instructions, is published on page 42.

EDITORIAL

National Convention Reports Fill Need

FROM "Dutch" Diehl's notebook we quote: "Annual meetings must be large in our country because ours is a large country. So large in fact that one sometimes wonders how annual meetings can possibly do all that they must do on national programs and issues. Obviously the answer to that wonderment is the thoroughness of the reporting of national meetings.

The editorial staff of ICE AND REFRIGERATION has long recognized this responsibility and opportunity of serving its readers through painstaking and adequate reports on the outstanding national conventions in the refrigerating field, as witness reports on the refrigerated warehousing meetings in New Orleans in the June issue and the National Ice Convention in Houston in the December issue, as well as subsequent annual conventions in previous years.

This is not a new policy—it was conceived and carried out many years ago by J. F. Nickerson, founder and publisher of ICE AND REFRIGERATION for more than 52 years. The wisdom of that policy is amply demonstrated, we believe, in the acceptance by these associations of ICE AND REFRIGERATION as the primary medium by which their members may keep themselves informed on what was said and accomplished at their annual conventions.

60 Years Ago

From the July, 1892 issue of ICE AND REFRIGERATION

THE SUEZ CANAL, opening in 1868, probably exerted greater influence upon mankind than any other single event says an editorial. Within a decade it had revolutionized all commerce, in that it was largely the cause leading to the substitution of steamships for sailing vessels, first in the ocean trade of the Orient and ultimately on the ocean in all parts of the world, and owing its existence directly to the success of the Suez Canal was the frozen meat trade of England's colonies in New Zealand and Australia.

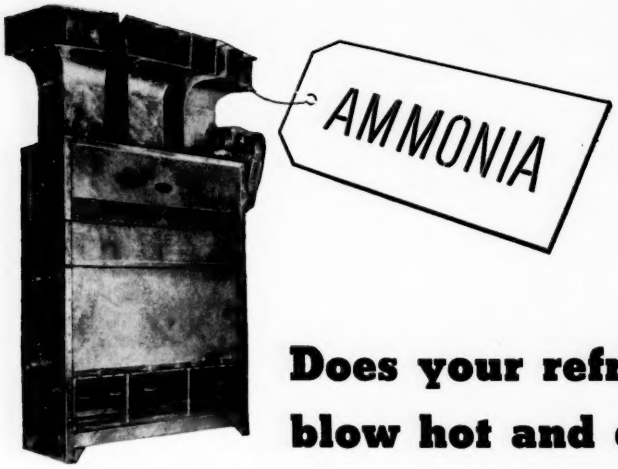
An ICE WAR was raging in Chattanooga, Tenn., between a brewery and an ice company, the price ranging from 10 cents to nothing. The ice company was selling at 10 cents per 100 pounds, when the brewery wagon came along and gave it away, and was threatening to give away refrigerators also.

AN EARLY SAFETY story tells about two ice wagon drivers racing on Greenwich Street, New York, one of whom upset a grocer's wagon into which eight children had climbed for safety. Two of the children were seriously injured and others suffered minor injuries. A police officer commandered a horse and buggy and, after a chase of several blocks overtook the drivers and arrested them.

ARCHITECTS were reported at work on plans for the cold storage building to be erected at the World's Fair at Chicago by the Hercules Iron Works. It was to be 150 x 280 feet and five stories high. The cold storage plant was to cost $90,000 and a connected ice plant $60,000.

CONSOLIDATION of the two branches of the Armour Packing interests was announced, Armour & Co. Chicago and the Armour Packing Co., Kansas City. The consolidated company expected to erect additions to the Kansas City plant at a cost of about $750,000. Seven new buildings were to be erected, the largest to contain the cooling rooms which were to be 500 feet long and 175 feet wide.

PRESENT DAY ADVERTISERS in this issue included Armstrong Bros., now Armstrong Cork Co., New York; Frick Co., Waynesboro, Pa.; Gifford Bros., now Gifford-Wood Co., Hudson, N. Y.; Weisel and Vilter Mfg. Co., now the Vilter Manufacturing Co., Milwaukee.



CARRIER COLD DIFFUSER

Does your refrigeration blow hot and cold?

Fluctuation in temperatures, dead spots in the refrigerated space and slow product cooling can cost you plenty.

With a Carrier Ammonia Cold Diffuser, you have cooling you can count on. Newly designed, they supply a steady, gentle flow of cold air to every corner of the refrigerated area, helping to preserve the natural flavor and freshness of food products.

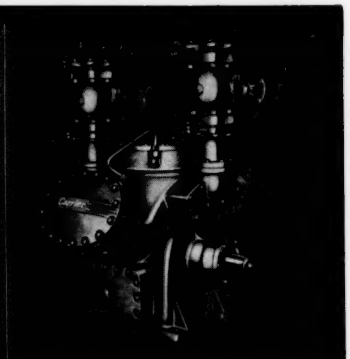
Adjustable air diffusion outlets mean there's a Carrier Ammonia Cold Diffuser for every application . . . high velocity outlets for long range diffusion . . . low velocity outlets with adjustable vanes for wide angle dispersion and control of air flow . . . duct distribution if the application calls for it.

Get full information on how Carrier Ammonia Cold Diffusers give you dependable refrigeration for the perishables you are cooling or storing . . . how Carrier's full line of Ammonia equipment is balanced in size and performance to work together with maximum efficiency. Write Carrier Corporation, Syracuse, New York.

Carrier

AIR CONDITIONING
REFRIGERATION
INDUSTRIAL HEATING

AMMONIA EVAPORATIVE CONDENSER



AMMONIA RECIPROCATING COMPRESSOR

Air Purification in Fruit Storage

Literature and experimental studies on air purification show its three main objectives to be longer storage life, reduction in storage scald on apples, removal of undesirable odors.

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Introduction

FEW subjects in the fruit storage field have been so controversial in recent years as that of air purification. Some of the reasons for the controversy are not altogether clear, but this paper was prepared to try to clarify the issues involved.

The objectives of air purification in fruit storage are three fold: 1—longer storage life through improved fruit firmness. 2—reduction in storage scald on apples. 3—removal of undesirable odors in storage.

As early as 1918 workers in the U. S. Department of Agriculture reported trails on removal of scald gases with activated charcoal. This work showed some promise but at that time no attempts were made to reduce scald in storage on a commercial scale by this method. Fontanel, working in France was probably the first to use activated carbon to try to remove ripening gases in fruit storage in 1936. Fontanel has written a letter to ICE AND REFRIGERATION lamenting the fact that he has not been properly credited in this country with his early work on air purification. It is true that we did not properly credit him until 1944 (9) when his work first came to our attention. Research on air purification was begun at Cornell in 1941 (8) and has continued until the present.

Experimental work has also been done at experiment stations in Washington, Oregon, Massachusetts, Indiana, Virginia, Canada, England and possibly other places. When a storage operator reads reports from all these investigators he ends up somewhat confused. While it is doubtless impossible for the author to be free from some bias, it is his opinion that the evidence is not as confusing as it might seem.

Does Air Purification Keep Fruit in Firmer Condition?

One of the main objectives of air purification with activated carbon is to try to keep fruit in firmer condition during storage. We have conducted a large number of commercial scale tests in New York comparing test fruit in rooms with and without air purification in the same storage plant (10 and 12). Since we have temporarily abandoned the use of brominated activated carbon, only the results with untreated coconut shell carbon will be presented here.

Fig. 1 indicates how much firmer (according to the pressure tester) apples were in rooms with air purification. In some 44 comparisons conducted over a period of six years, it was found that on the average apples were about 1.5 pounds firmer in air purification rooms. The significance of figures of this sort might be demonstrated on a variety like McIntosh. This variety is usually picked at a pressure test of 15 to 16 pounds. It must be moved out of storage before it reaches 9 pounds pressure test. It is unmarketable at 7 pounds.

From pressure test figures at the start of the storage season and at the end of the storage season, estimations were made on the "days storage life added as a result of air purification." Data on a number of individual tests appear in Fig. 2. On the average about three weeks was added to the storage life of R. I. Greenings and about four weeks or slightly more with McIntosh.

Perfectly just criticisms have been levelled at these commercial scale tests. One was that undetected tem-

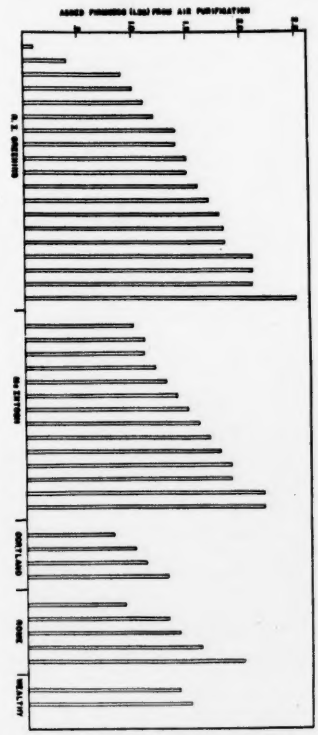

Fig. 1—"Fruit firmness added" as a result of air purification with several varieties of apples in different commercial scale tests.

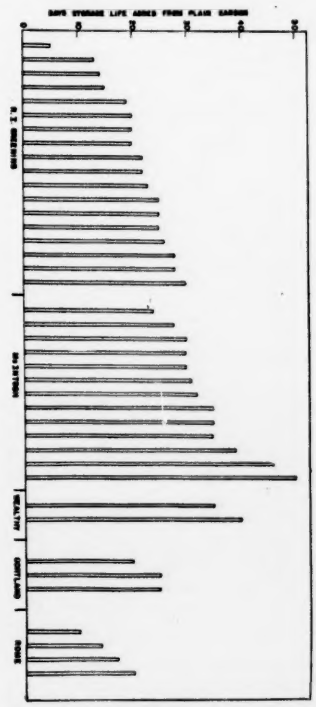

Fig. 2—Days storage life added (estimated from firmness data) as a result of air purification with different varieties of apples in different commercial scale tests.

perature differences might exist between test rooms even though thermometer readings in the rooms were 32 F. Another was that the level of fruit volatiles might be higher in one room than in another. This could be true if one room had more ripe apples in it or if one room was more leaky than another.

In view of these criticisms a number of carefully controlled experiments have been conducted with small lots of apples. The technique used has been called, "air purification during controlled ventilation" and has been described in detail elsewhere (11). The results expressed as "added firmness as a result of air purification" appear in Fig. 3.

Apples with and without air purification by coconut shell carbon were compared at the end of the storage period. The results in Fig. 3 show about the same differences as were obtained in the commercial scale tests. No ripe apples were included in these small scale tests, with the apples essentially being protected from their own ripening vapors. One obvious criticism here is that not enough of the tests were conducted at low storage temperatures. On the other hand, even at low storage temperatures air purification increased storage life by 18-25 percent.

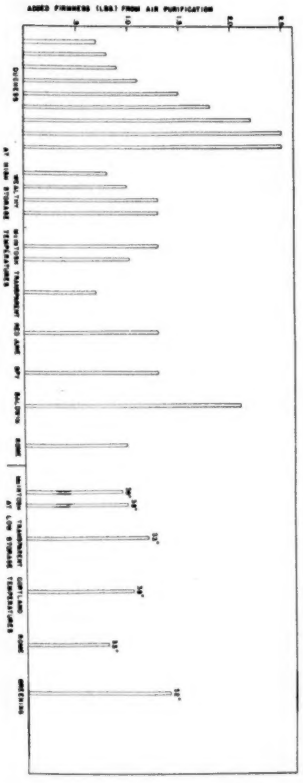

Fig. 3—Fruit firmness added as a result of air purification with several varieties of apples in different small scale, well controlled tests. Note that some tests were at high storage (65-74 F) temperatures and others at low (32-38 F) temperatures.

Experiments Under Controlled Conditions

While six small scale experiments have been conducted under well controlled conditions at storage temperatures, only two representative ones will be presented here. The first test involved Cortland apples stored at 38 F. One lot of fruit was held in an open box in a room with a presumably very low volatile level. This assumption was made on the fact that only 6 boxes of apples were held in this room with a capacity for 500 boxes. All other lots were held in the closed system with controlled ventilation as described previously (11). There were 6.4 theoretical air changes per air around these fruits every hour. Approximately 5 percent of fresh air was ventilated into each lot continuously to maintain an average carbon dioxide level of 0.5 to 0.7 percent. The results appear in Table 1.

It will be noted in Table 1 that the air purification with carbon resulted in fruits 1.1 pounds firmer than the control. This difference was highly significant statistically. Carbon reduced the scald but did not control it. Silver permanganate on zinc oxide (7) was not quite as good an air purification agent as coconut shell carbon in this test. Shredded oiled paper used at the rate of ½ pound per bushel in the recirculation system (with the paper around the fruit) had no effect on fruit firmness but reduced the scald as much as did the carbon treatment. The apples in an open box ripened less and had less scald than the "control" fruit stored in the recirculation system. This difference was highly significant. This comparison shows how the volatiles of a lot of apples tend to both ripen up and scald the apples when the volatiles are somewhat confined.

TABLE I—AIR PURIFICATION OF CORTLAND APPLES AT 38 F.

Treatment	Firmness	Storage Life Added	Total Scald
	lbs	%	%
At Harvest 10/1/51			
	16.5	—	—
After Storage 1/2/52			
Open box	10.9	—	5.0
Control	10.3	—	50.0
90 ml coconut carbon	11.4	18	20.0
90 ml silver permanganate	11.0	12	30.0
Shredded oiled paper	10.3	0	20.0

In a second test Rhode Island Greening apples were stored at 32 F with regulated ventilation in the recirculation system. Since the room in which these apples were stored was practically full of other fruit, outside air was used for ventilation purposes. The results appear in Table 2.

Again carbon resulted in fruit that was highly significantly firmer than the control. Carbon reduced the amount of scald at examination after storage but when the fruit had been held 2 days at room temperature there was only a small reduction in the amount of severe scald. The silver permanganate air purification treatment was highly significantly better than the control from the standpoint of fruit firmness but carbon was significantly better than the permanganate.

In addition to measuring fruit firmness and ground color, respiration measurements were also conducted on some lots held at 74 F. Some of these results have already been presented (11). The respiration rate of 8 lots during air purification have now been measured. The varieties were Duchess, Wealthy, McIntosh, Baldwin, Northern Spy and Rome Beauty. Fig. 4 shows the results with Rome Beauty. In addition to activated coconut shell carbon, silver permanganate on zinc oxide was used (7).

TABLE II—AIR PURIFICATION OF R. I. GREENING APPLES AT 32 F.

Treatment	Firmness	Storage Life Added	Scald after storage			Scald after 2 days		
			Slight	Severe	Total	Slight	Severe	Total
	lbs.	%	%	%	%	%	%	%
At Harvest 9/10/51								
	25.0							
After Storage 1/31/52								
Control	16.8	—	96.0	4.0	100.0	0.0	100.0	100.0
90 ml coconut carbon	18.2	19	75.0	0.0	75.0	12.0	88.0	100.0
90 ml silver permanganate	17.6	10	92.0	0.0	92.0	0.0	100.0	100.0

Both this material and the coconut carbon resulted in a lower than normal respiration rate. On the average, with 8 different tests with apples the respiration rate was reduced 16 percent. The fruits had to be pre-climacteric when the test was started or there was no reduction in respiration rate as a result of air purification.

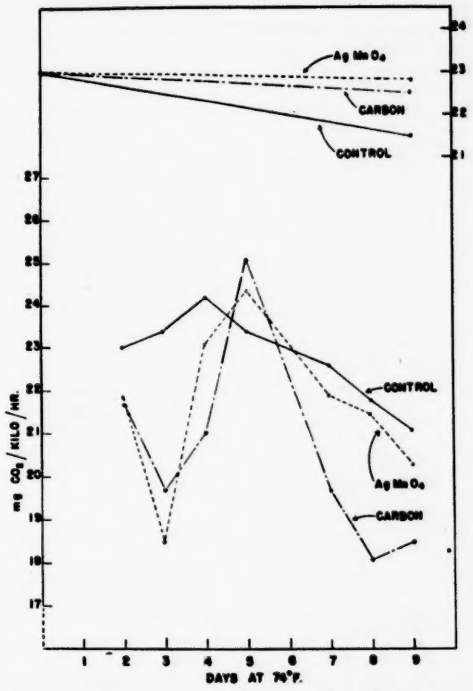

Fig. 4—Effect of air purification with activated carbon and silver permanganate on respiration (lower curves) and firmness (upper curves) of Rome Beauty apples.

Lengthening Storage Life of Apples

Confirming evidence on the effect of air purification in lengthening storage life of apples has been offered by Southwick in unpublished work in Massachusetts working with McIntosh and Cortland. Van Doren and Bullock (13) working in Washington have had similar benefits with varieties like Delicious and Golden Delicious. Hansen (6) working in Oregon has reported benefits on Anjou pears with air purification. In later work he demonstrated that in large scale commercial tests these benefits were not apparent. He does not yet know why he could not repeat in large scale trials what he found in the laboratory. Baker and Maxie (1) working in Indiana on Red Romes found no benefit in 1949 when the apples were picked in a "mature" condition. In 1950 when the Red Romes were picked at 20.3 pounds firmness they showed a response to air purification. W. R. Phillips working in Canada has shown in several unpublished reports some benefit from air purification on apples.

On the other hand, several investigations do not show any advantages to apples or pears from air purification from the standpoint of added fruit firmness. Fidler (2) working in England has shown no response of King Edward VII apples to air purification with either brominated or unbrominated carbon in gas storage (controlled atmosphere storage). Our Cornell work has shown little or no advantage of air purification in controlled atmosphere storage from the standpoint of fruit firmness. Our guess on this is that the low oxygen and high carbon dioxide effects outweigh the effects of removal or partial removal of volatiles.

Reports by Gerhardt (3) and Gerhardt and Sainsbury (4) show no response of apples and pears to air purification with the exception of an early picking of Bartletts. These studies showed no reduction in ethylene concentration by the air purification treatment with unbrominated carbon.

The question naturally arises as to how the clear cut results of these two studies can be reconciled with the work mentioned previously. In the Cornell studies only preclimacteric fruit (fruit that had not yet passed the respiratory peak) was used. In the commercial scale studies mixed lots of fruit were in the room but an effort was made to keep overly ripe apples out of the test rooms.

In Gerhardt's first report early and late pickings of several varieties of apples and pears were stored in the test rooms and then the rooms were filled with cull Jonathans. The carbon was saturated early in the storage season. In the second report pears and apples were stored in the test rooms with the rooms finally being filled with "over-ripe cull Delicious." Again the carbon was saturated early in the storage season. The apples used were somewhat softer at the beginning of the test than used in Cornell studies. The test apples were furthermore held 2 days at room temperature before being placed in storage at 31 F. The control room was better ventilated than the carbon room. Our interpretation of these results would be that the apples were possibly too ripe when they went into storage. Secondly, the volatile load was too much for the carbon present.

Here we come to a difference in viewpoint. The viewpoint of the U.S.D.A. studies at Wenatchee would seem to be that air purification should take care of the worst possible situation. That viewpoint is perfectly justifiable but is not the one that we hold. We store apples picked in prime condition and store them promptly. We try to keep ripe apples out of the storage. In other words, we are trying to protect apples from *themselves* and not necessarily from a rather high percentage of ripe fruit.

Removing Ethylene

Gerhardt (3) and Gerhardt and Sainsbury (4) have pointed out that untreated carbon does not remove ethylene. Fidler (2) has shown the same thing. It is true that in our early work we felt that carbon must be removing ethylene because of the benefits we obtained. In 1949 C. R. Gross, working in our laboratories showed that untreated carbon was not removing ethylene unless very high concentrations were encountered. Naturally, the question arises

then as to why carbon can keep apples firmer.

It is our contention that apples give off ripening gases in addition to ethylene. Gross has removed the ethylene gas from ripe apple emanations and still has found a stimulation in ripening of these emanations on preclimacteric fruit. Coconut shell carbon will remove these other ripening volatiles until finally saturated with them.

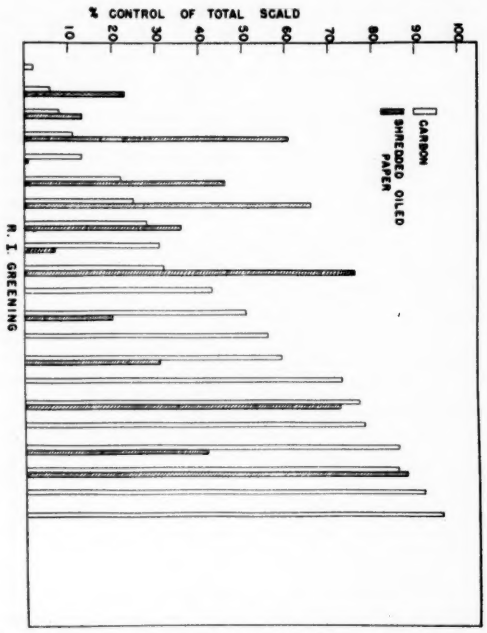

Fig. 5—Percent control of total scald on Rhode Island Greening apples in different individual tests in commercial scale trials. Comparison of control with shredded oiled paper and air purification is given. Percent of control was calculated from scald on treated and untreated lots in each test.

Colbert (1A) has recently suggested that the storage atmosphere be mixed with high concentrations of ozone in a catalytic chamber to remove the ethylene. The ozone was then reduced to a non-toxic concentration by deozonization with activated carbon. The carbon removed acetaldehyde perfectly and would remove the other heavier volatiles. Gross, working in the Cornell laboratories found several years ago that there was little promise in this ozone-deozoniation idea for ethylene removal. Colbert's work does define more carefully the exact conditions needed for ethylene removal by ozone, however. Actual experimentation with fruit storages will be required before it can be shown that this ozone idea has merit from the standpoint of longer keeping quality.

Reducing Apple Scald

Fig. 5 shows the percent *control* of total scald found on R. I. Greenings at the end of the storage season. The apples were exposed to air temperatures for 3 days after storage before scald counts were made. Comparisons with the control obtained with one-half pound of shredded oiled paper per box show that in some tests air purification was better than oiled paper and in others the reverse was true. On the average, one was about as dependable as the other. Only a few tests were conducted with oiled paper wraps but they always gave better control than either air purification or shredded paper.

Work by the U.S.D.A. at Wenatchee, Washington (4) has shown some reduction in scald with air purification but shows that oiled wraps are more dependable in scald control.

Fidler (2) working in England has shown that air purification has not controlled scald at all well on King Edward VII apples in 8 percent carbon dioxide and 13 percent oxygen at 38-40 F. It is our view that scald control is very difficult in an atmosphere of this sort with air purification particularly on a scald susceptible variety. On McIntosh held in controlled atmosphere storage in New York and New England, air purification is the standard method of scald control. The variety is not highly susceptible to scald and secondly we use a very low oxygen concentration (3 percent).

Baker and Maxie (1) have reported control of a "spot type" of scald on Red Rome Beauty by means of air purification.

It must be admitted that air purification is not a perfect scald control measure. The scald gases are difficult to get out of packages and stacks to the carbon that will adsorb them. In several experiments at Cornell it has been shown that with *perfect* circulation around every fruit that air purification would completely control scald on Greenings. This is impossible on a commercial scale. Fidler's work with King Edward VII apples would not indicate that perfect air circulation helped matters in scald control in gas storage on this variety, however.

Removal of Storage Odors

It does seem rather generally agreed upon by workers in New York, Washington, Massachusetts and Canada that air purification with high grade carbon will remove many undesirable odors. The common odors of wood used in containers and wooden construction are easily removed. Mold growth can be controlled by good plant sanitation, good air distribution, or the use of ozone. In a very moldy situation carbon does not do a perfect job in removing odors.

The most striking example of odor removal and hence improvement in fruit quality is seen in apples coming out of controlled atmosphere storages. In this type of storage the odors are very much confined and hence absorbed by the fruit unless removed in some way. One New York processor wants apples from air purified rooms because of the freedom of odors that can carry over into his apple dessert product.

Fruits Others Than Apples

Gerhardt (3) showed some slight response to early picked Bartlett pears. There was no improved storage life in the other pears. Van Doren and Bullock (13) have reported adding a month to the storage life of Bartlett pears with air purification and a reduction in core breakdown.

Hansen (6) showed a rather marked response on Anjou pears in small scale tests. The results in commercial tests were disappointing. The possibilities of air purification for pears remain to be more fully demonstrated.

Probably one of the most perishable fruits we store is the peach. To be of high quality after storage the peach must be on the ripe side when placed in storage. Peaches in this condition are too ripe to be expected to respond to air purification. The author has conducted only one experiment with peaches and the advantage from air purification was almost nil. More research needs to be done on the peach, however.

Results of Commercial Users

Three companies are selling commercial air purification equipment. During the 1951-52 season it was estimated that well over five million boxes of apples were under air purification. The author is in no position to judge the reaction of very many commercial users. However, he has visited quite a number of storages in the East using air purification. In general, the users are very much satisfied with their results even though they would frequently admit that they could not critically evaluate their results. For example, they might not have had similar apples with and without air purification in their storages.

The Requirements of Good Air Purification

For improvement in fruit firmness, the fruit must not be too ripe when placed in storage. Apples or pears that have gone over the respiratory peak cannot be expected to respond to air purification. Apples picked in prime condition for storage and promptly stored should show some response, other things being equal.

The room must not be overloaded with ripe fruit. Excessive quantities of carbon would be required to protect prime apples from the vapors of "drops" or apples that have set outside the storage for several days to a week.

In our work with apples we have recommended six pounds of coconut shell carbon per 1000 boxes of apples with an air flow of 100 cubic feet per minute moving through this amount of carbon. If the room is badly overloaded with ripe fruit, this amount of carbon will be insufficient.

There must be good air distribution in the storage rooms. This means good stacking and proper duct work. Air purifiers have been used in coil cooled rooms by proper placement of the units above the stacks.

In our trials at Cornell only coconut shell carbon has proven really successful though many other types have been tested.

Type of refrigeration may account for some differences in various tests on air purification according to Grierson-Jackson (5). For example, brine spray units will prevent condensation of certain volatiles on the coils with the frost. Defrosting with heaters such as "calrod" heating elements just drives the condensed volatiles back into the atmosphere.

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Pelican Storage in Business Fifty Years

THE Pelican Ice & Cold Storage Inc., New Orleans, La., is rounding out its first half-century of operation under the same family management this year, with a new generation having taken over the reins at the start of the year following the death of Theodore S. Behre, who died in November following 43 years of active connection with the business, and for the last three years of his life as its president.

He is succeeded in the presidency by his son, Daniel Behre, and he is seconded in the management of the business by his brother-in-law, John F. Little, secretary-treasurer.

The Pelican is the oldest and largest ice plant in New Orleans, with a potential capacity of 500 tons of refrigeration daily. They maintain a pipeline service, which is being expanded for the use of processors and manufacturers, in addition to their regular cold storage space.

The business was founded by Chas. H. Behre who was active in its management until his death some years ago.

Prepacking Broccoli for Refrigerated Shipment

EVIDENCE that it pays to prepackage broccoli in transparent film bags for long shipments under refrigeration comes from a cooperative study recently completed by the U. S. Department of Agriculture and the Western Growers Experimental Institute. The findings are based on research by G. L. Rygg of the Bureau of Plant Industry Soils, and Agricultural Engineering, and W. W. McCoy of the Institute.

Object of the study, which was made under the Research and Marketing Act of 1946, was to test the adequacy of transparent films for prepackaging broccoli for transcontinental shipment and marketing.

In these tests the prepackaged broccoli, held at temperatures of 34 to 44 F, retained better color, higher vitamin C content, and more moisture than that not packaged. It remained in good condition for the 11-day holding period (to simulate transcontinental shipping) at the refrigerated temperatures. However, when it was removed to ordinary store temperature (70 F), the shelf life of the broccoli was short. At the end of two days the non-packaged (loose) broccoli and that in all perforated film bags was severely yellowed or discolored. Broccoli in most of the nonperforated film bags had developed serious off-odors and off-flavors.

The tests demonstrate that refrigeration is the most important factor in maintaining the quality and attractive appearance of broccoli, and that a combination of good refrigeration plus prepackaging results in maximum quality and shelf life.

Falstaff Enlarges and Modernizes Brewery in New Orleans

DEDICATION ceremonies Wednesday, May 28, marked the completion of a two-year expansion and modernization program which has made Falstaff Brewing Corporation's plant in New Orleans the largest brewery in the South.

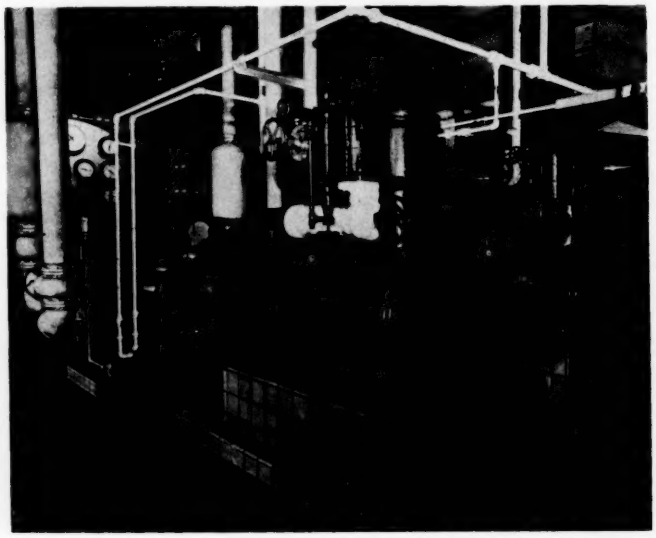
The dedication took place in the afternoon when Alvin Griesedieck of St. Louis, Falstaff president, unveiled a bronze plaque that dedicated the plant to Falstaff's "faith in the continuing growth of the South." The ceremony followed a parade through downtown New Orleans and a luncheon at Hotel Roosevelt attended by community leaders and Falstaff personnel.

A. Miles Pratt, president of the Chamber of Commerce, and City Commissioners A. Brown Moore and Glenn Clasen participated in the program to hail the achievement as a triumph in industrial progress for both the company and the community. Harvey Beffa, St. Louis, Falstaff's first vice-president and general manager, and Robert E. Powers, New Orleans resident manager, were program participants along with the company president.

Falstaff's board of directors, who had scheduled a regular meeting that day in New Orleans to coincide with the dedication program, were present, as were all company officers and top management from the firm's executive offices in St. Louis.

Following the dedication, guests were taken on tours to see the plant in operation.

Construction on the plant expansion was started in May, 1950, when some existing buildings were demolished to make room for the new addition. Now occupying parts of six city blocks, Falstaff's expanded plant has boosted capacity from 750,000 barrels two years ago to more than 1,100,000 barrels of beer annually.



The new Vilter ammonia refrigeration machines added to the temperature control equipment in Falstaff's expanded New Orleans plant. One of the machines is always on a standby basis. The new units are powered by two Elliot DYR steam turbines rated at 159 hp each.

Eight-Story Addition

Largest unit in the expansion is a new eight-story addition, towering above surrounding buildings and adding more than 1,000,000 cubic feet of inside space. The eight-story structure will be topped with a steel-framed sign and weather forecasting globe, now under construction, which will extend to the equivalent of 13 additional stories, or for an overall total height of 21 stories above ground.

Within the new building are contained new and modern machinery and equipment for both brewing and bottling Premium Quality Falstaff. Space on the first and second floors will be utilized for bottle shop operations which, linked with the adjacent original bottle shop, will give the plant a total of seven complete bottling lines, or double its former capacity. Bottle sterilizers, fillers, pasteurizers, labelers and case packers are included among major items of new equipment.

Additional Brewery Space

The remaining six floors of the new unit provide additional space for the brewing department. Fermenting, settling and storage cellars occupy the third, fourth and fifth floors. On the sixth floor are found cooler rooms, the yeast room, plenum chamber, fan room, refrigeration equipment, surge tank room and employes' locker rooms. The seventh floor houses new stainless steel coolschiffe tanks, while the eighth floor is taken up with domes and vents for the latter.

New facilities have increased the plant's refrigeration capacity to 1,000 tons per day.

Refrigeration Equipment Made in Canada

REFRIGERATION equipment manufactured or assembled in Canada during 1951 was valued at $78,359,500, of which 278,272 household mechanical refrigerators—electric and gas—accounted for $54,970,000, according to the Dominion Bureau of Statistics. All other types of equipment, including home freezers, fixtures, evaporators, compressors, etc., were valued at $23,389,500.

British Refrigeration Machinery Exports

DURING March refrigerating machinery to the value of £1,560,810 ($4,370,268.00) weighing 2,864 tons was exported from England. Comparable figures for March, 1951 were 2,040 tons valued at £940,911 ($2,634,550.80). Monthly average during 1938 was 236 tons valued at £33,031 ($92,486.80).

New Fish Freezing Plant Opens

Cold Storage and Freezing Department is added by St. Louis concern to take care of expanding business. Construction and refrigerating features strictly modern

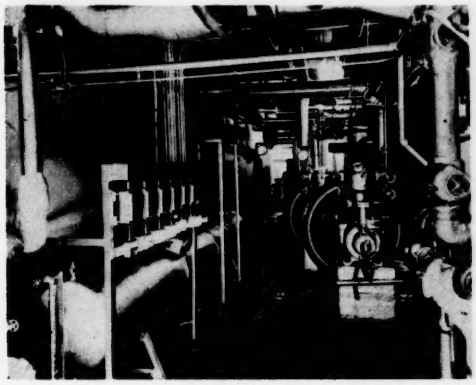
THE Independent Fish Company of St. Louis, together with its subsidiary, the Clipper Packing and Cold Storage Company, Inc., held an open house at its plant on Market Street last December to show the trade its completely rearranged plant and the new freezing and holding room.

This new freezer adds 200,000 cubic feet of freezing space to the plant making it one of the most modern and one of the largest in the seafood industry. Carl Pass, who started in business in this same location with a small retail fish stand in the depression year of 1930, estimated that the firm now is operating some 300,000 cubic feet of freezer space, and that the maximum total capacity would approach 15,000,000 pounds of frozen seafood.

Mr. Pass started with 1,500 cubic feet of cooler space and the amazing growth of the business reflects the hard work and good business judgment of the five partners—Carl, his three younger brothers, Isadore, Sam and Joe, and their father Abraham. Through years of working together they have developed into a compact and efficient team, which keeps things rolling smoothly in this wholesale seafood business which buys and sells in all parts of the world and supplies a local area within a hundred-mile radius.

Carl gives credit for the steady growth of the wholesale business to the policy of "having the merchandise when you customers want it," and to providing enough storage and freezing space to hold the proper quantities of merchandise until they are needed.

In supplying their wholesale customers, the partners began to notice that there was a much greater margin of profit to be made in merchandise that was held for a time than was to be made from quick turnover. This observation led to an increased emphasis on freezing and holding seafood and to a steady increase in the amount of refrigerated space.



Compressor room which furnishes refrigeration for freezer and holding room, Independent Fish Co., St. Louis, Mo.

A section of the cold storage holding room, Independent Fish Co., St. Louis, Mo. Note blower outlet at right of picture.

Holding Space Increased

With increased holding space the partners and their representatives covered production centers in all parts of the nation, and eventually in all parts of the world, to buy in large quantities at the best possible price for storage to supply some later demand. And as the scopes of their purchasing widened so did the range of their customers. From serving just a few stores in their section of the city the area of their service spread to cover a hundred-mile radius for their local area which is served with a fleet of twelve GMC trucks.

About two years ago, the partners decided that their business showed signs of so seriously outgrowing its quarters that they should make some long-range plans for constructing additional storage space.

For technical advice, they obtained the services of Allen W. Cox, district manager for the St. Louis branch of the Cork Insulation Company, Inc., and the two partners, Lester V. Fleiter and Collins C. Posey, who run the L. V. Fleiter Company, distributor for Frick Company, Waynesboro, Pa.

Building Ell Shaped

Following discussion and planning they designed an ell-shaped building around and behind portions of the original plant, 137 feet long by 100 feet wide on the longest dimensions, with a height inside the freezer of 20 feet, giving a total area of about 200,000 cubic feet, which is completely surrounded and insulated by cork, and refrigerated by three Frick air-cooling units.

The outside brick walls were built and a concrete foundation floor was

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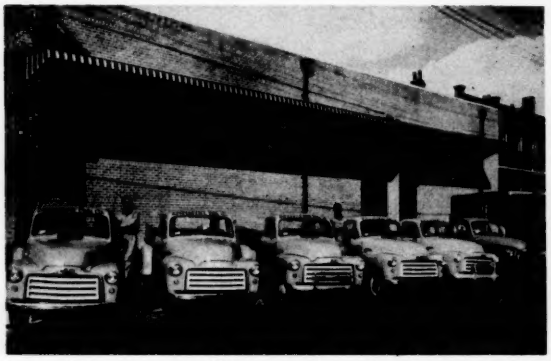
poured for the entire closed area; then eight inches of cork insulation was applied to the walls and floor, and another concrete floor poured on top of this cork. All of the steel for the building rests on this second concrete floor, on top of the cork. And since the roof is supported on this steel independent of the walls and the nine inches of cork insulation is on top of the roof structure, the entire building is built within a cork sheath and no structural steel or masonry penetrates this cork sheath at any point.

The inner layer of the brick wall is composed of Haydite block tile. The first layer of four-inch corkboard is erected against the Haydite block in a bed of Enamelite about ⅛ to ¼ inch thick. Enamelite is manufactured by the Presstite Engineering Company of St. Louis. It functions as a back plaster and also serves as a vapor seal and an adhesive having bonding strength in excess of 100 pounds per square inch. The second layer of cork was applied over the first in the usual manner with hot asphalt being used as an adhesive. A plaster inner wall surface was put on over this layer of cork to produce a smooth wall that is easy to keep clean.

The structural steel consists of 21 columns, six inches in diameter, connected by steel beams. Between the beams are run bar joists to support the inner roof of corrugated asbestos sheeting. These open web joists are cross-braced one to the other and welded to the beams, forming a sturdy structure. The "valleys" in the corrugated sheeting on the top side are filled with ground insulating material, and the first of three layers of corkboard is laid directly on top of this. There are three layers of three-inch corkboard insulating the roof, and the top layer is covered with a regulation eight-ply built-up roof, as a vapor seal and as protection against the weather.



Some of the company delivery trucks are lined up across the rear entrance to the new freezer and storage plant.

Processing operation in the whiting room where conveyor carries fish for processing.

This absence of structural contact with the outside prevents the seepage of heat and moisture into the freezer and helps prevent condensation. There are five openings into the room for special refrigerator doors. The only other contact between the room and the outside are the pipes which carry the electric wiring and the coolant and one special pipe which was placed in the wall to allow the line for an electric welder to be brought into the freezer in case of repairs or alteration to the equipment requiring welding.

Cork Insulation

The cork insulation in the walls and floor is composed of two layers of four-inch Corinco corkboard, furnished and installed by the Cork Insulation Company. For the floor, a layer of vapor barrier paper was laid over the concrete foundation in hot asphalt; on top of this the two layers of four-inch Corinco corkboard were laid, each layer being placed in a coating of hot asphalt and a final coating of asphalt and another layer of vapor barrier paper finishing off the top of this insulating layer. The concrete floor, heavily-reinforced, was poured directly on top of this last layer of vapor barrier paper.

The Freezers

The Independent Fish Company had two separate freezers before the construction of the new freezer. One of these freezers was 42 feet by 20 feet, and the other was 42 feet by 10 feet; both had iron pipe coils. In rearranging and reconditioning the plant equipment the pipe coils were removed because of the defrosting problem and because they considered that the coils took up too much valuable space. In place of the coils two new Frick low temperature air cooling units were installed; a Model 10002AU in the larger room and a Model 7515AU in the smaller. These two rooms are situated within the ell formed by the new freezer and will be used in conjunction with it.

In addition to these two freezers there is a 44 by 9 foot cooler near the main door into the big freezer. This cooler is kept at 33 F while all of the freezer space is kept at minus 10 F. The work space and shipping departments are air cooled by a 10 ton unit and the office space is cooled by a 5-ton self-contained unit.

Air Cooling Units

In the new freezer are located three new Frick 15003AU low temperature air cooling units, equipped with water defrosting. By means of this water defrosting, spraying warm water over the coils, and a set of baffles, the coils in a unit are freed of frost in five minutes. All of the freezers are completely automatic, using a liquid line solenoid valve and thermostat. Each of the units in the big freezer is controlled separately to avoid a variation of temperature in this large space.

Since the main entry door is almost constantly in use during the business day, the unit near the door operates much more often to keep the temperature in this portion of the room at minus 10 F than do the other two in the portions of the room far removed from the door and the warm air that slips in whenever it is opened. This arrangement has proved to be of great assistance in maintaining an even temperature all over the room.

Ducts for Air Cooling

Also of great assistance in maintaining an even flow of air to all parts of the freezers is the design of the special ducts which were constructed for this job. The ducts rise from the air-cooling units to the ceiling and run just under the bar joists the length of the space to be cooled by that particular unit. The ducts are made in two sections, held together by bolts through the angle-iron flanges on each side.

The length of the bolts allows an adjustment of the space separating the two halves of the duct, forming a continuous slot on both sides of the duct for the whole length. The width of this slot may be adjusted to vary from one to two inches, regulating the amount of air that is distributed to that particular part of the room. This even distribution of the cooling air reduces the "blast" effect to the very lowest minimum, helps to maintain a more even temperature and to prevent dehydration of the merchandise stored in the freezers.

Engine Room

The engine room for the plant is located right in the center of the ell, where its walls are in contact with all of the freezers. This has meant a great saving in piping and insulation as well as making it more convenient for placing the controls in the engine room for the equipment in the freezing rooms. In the engine room are located the new Frick 7x7 two-cylinder ammonia compressor and the Frick 8¾ x 6 and 7¾ x 5 ammonia boosters. The 7 x 7 is driven by a 50 hp Wagne electric motor and is installed for the second stage of compression; the 8¾ x 6 is driven by a 30 hp Wagner motor and the 7¾ x 5 by a 20 hp Wagner motor, and both are installed for the first stage of compression.

Both compressors are arranged with capacity control to reduce the capacity when the loads are light. This is essential since it gives an increased flexibility that makes it possible to maintain minus 10 F in the freezers with a temperature variation of only about 3 F at any time. This small differential keeps dehydration of the seafood stored in the freezers at a minimum.

Two 6½ x 6½ two-cylinder compressors and a 3-ton ammonia compressor for the cooler were being used in the former plant and are retained in the new engine room. All of these compressors, including the new ones, are so inter-connected and valved that any compressor or combination of compressors may be used in connection with any piece of cooling equipment. Each compressor is operated by a low pressure control and is protected by a high pressure cutout. A two-stage compression system is used because it will operate more economically since it allows each compressor to run with a lower discharge temperature. This also reduces the wear on the compressor parts and decreases the maintenance requirements.

Gas Cooler

A new Frick 16-inch by 8 foot high combination liquid gas cooler performs two functions: it cools the ammonia discharge gas from the booster and precools the liquid ammonia going to the air cooling units. A new Frick liquid line oil separator was installed above the ammonia receiver to separate the oil which accumulates in the line from the liquid ammonia. This ammonia receiver is made by Frick and is 24 inches in diameter by 16 feet long, which provides ample volume for the ammonia required to operate the system.

On the roof above the engine room, a new Frick 15003AE evaporative condenser was installed on steel supports to save space. The water sump tank and the water pump for this condenser are located in the engine room so that the water may be protected from freezing in cold weather. All of the electric controls, water defrosting valves, and a panel with a series of pilot lights indicating the equipment in operation are located in the engine room, giving a central point for control of the whole plant. A seven-day recording thermometer is installed in the engine room for each freezer to keep a record of the temperatures maintained during that period, and these recorders are checked at regular intervals each day to be certain that the proper conditions are being maintained.

Mechanical Handling

To make the best use of the freezer space required a stacker that could stack as near as possible to the 20-foot ceiling and require the least aisle space. For this a Jackstacker Truck, manufactured by Lewis-Shepard Company, Watertown, Mass., was selected. This truck has a 4000 lb lifting capacity and needs only a 6½ foot aisle space. This electric-battery-driven truck and a companion Jacklift truck handle all of the palletized merchandise in the freezer and around the plant.

Merchandise not stacked on pallets is handled by a system of Rapids-Standard conveyors. A long single conveyor runs almost the entire length of the freezer, from loading door in the rear wall to a point just short of the main door leading to the front of the plant, and may be connected to another conveyor-pass door in the front wall by an extension wheeled conveyor to give straight-through service if needed.

These loading doors, or conveyor-pass doors, were especially designed for this project by the Cork Insulation Company, and they consist of a three-foot tunnel protected by a drop curtain on the inside and a vertical-sliding overlapping door on the exterior of the building, which is protected by a Kinnear rolling steel door. The conveyor-pass door is so constructed that a Rapid-Wheel conveyor may be pushed through the tunnel to connect with the long conveyor inside the freezer so that merchandise may be loaded on or from trucks quickly and without serious seepage of heat.

There are two of these doors in the rear wall and one in the front wall of the freezer. One 4 ft 6 in. by 7 ft Super Freezer Overlapping vestibule door with 8 inches of corkboard all metal clad, is in the front wall, and an identical door is in the rear wall to permit the passage of the lift trucks. These doors were manufactured by National Refrigerators Company and were installed by Cork Insulation Company.

Conveyor To Whiting Room

An inclined Rapids-Standard conveyor connects the freezer with the whiting room, which is located in the basement near the main entrance to the freezer. Here women work at a special stainless steel processing table, the design for which was developed to fit the needs of the Independent Fish Company. The whiting are slid down a chute to the room, separated, and placed on a conveyor which carries them to the processing table. On the table itself, a broad conveyor carries the fish along before the women who do the processing and another conveyor carries the processed fish to the end of the table where they are boxed and shuttled across on a wheeled conveyor to the inclined conveyor which carries the boxes of fish back to the freezing room where they are frozen and stored. A Hayssen wrapping machine is being installed to overwrap one pound consumer packages.

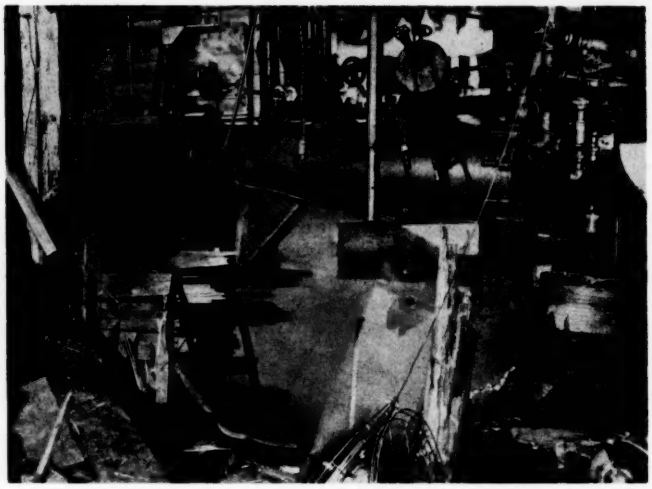
After January 1, 1952, space was available for public storage as a bonded warehouse, where spot stocks of frozen fish or other commodities are handled.

Ammonia Receiver Explodes Cause Traced To Defects in Safety Equipment

AT a cold storage warehouse the refrigerating system was running normally when the owner checked it before he locked the plant for the night. Discharge pressure was 135 psig; suction pressure was 0 psig; bearings and other parts of the compressors were in good order, and the pump that supplied the condenser with cooling water was running.

In spite of this arrangement of safety valves and automatic controls, half-an-hour after the owner left the plant the pressure got out of control and one of the receivers blew up. Some of the damage is shown in the accompanying photograph.

An investigation established the probable sequence of events that led to the accident and disclosed that



Compressor room of cold storage warehouse after ammonia receiver exploded. Sheet of metal standing below condenser is a part of the vessel that blew up.

The 150 hp ammonia system was designed to take care of itself without a night operator. In addition to the usual operating controls, it was well-supplied with safety devices. Protection against overpressure was provided by:

A high pressure cut-off switch on the ammonia discharge line.

One safety valve on the discharge header.

One safety valve on the condenser.

Two safety valves on No. 1 receiver.

Two safety valves on No. 2 receiver.

The system was also protected against failure of the condenser-water pump. The motor driving this pump was interlocked electrically with the compressor motors so that the compressors would be shut down automatically if the pump motor stopped for any reason.

things had not been as normal as they appeared—instead, there had been an unusual combination of accident-producing conditions in existence. There was an unexpected defect in the shaft of the condenser-water pump, and other defects in a seam of the receiver that exploded; the interlock on the pump motor did not provide the protection expected of it; and the high pressure cut-off switch was faulty.

Pump Failed First

The condenser-water pump failed first. The shaft broke and the pump stopped. But the driving motor on the pump continued to run, so the interlock was not called into play. Thus the compressors continued to operate, and pressure on the discharge side started to rise because there was no cooling water for the condenser.

When the pressure reached the point where the cut-off switch should have tripped, the switch failed because an adjustment screw had dropped out of its mechanical linkage. So the compressor kept running and pressure kept increasing until one of the receivers exploded.

It is believed that the explosion happened before the safety valve pressure was reached. At least the valves were found to be in good order and relieved at 275 psig when tested after the accident.

Of course the vessel was supposed to be strong enough to withstand pressures considerably higher than 275 psig. But it was found that its welded seams had been weakened by defects located at inaccessible points on the inside of the vessel.

The defects were in the form of voids where the weld metal had not been fused thoroughly with the parent metal. This faulty condition probably had been aggravated during 17 years of service, and lowered the strength of the seams sufficiently to permit an explosion at some pressure less than 275 psig.

Published by permission from "The Locomotive," Hartford Steam Boiler Inspection and Insurance Company.

Fewer Accidents Reported Severity Increases

WORKERS employed by member companies of the National Safety Council had fewer accidents in 1951, but the mishaps they did have were more serious. Industrial injury rates for last year, released by the Council in advance of the 1952 edition of its annual statistical yearbook, "Accident Facts," show a modest reduction in frequency but an equal increase in severity of 1951 accidents as compared with 1950. Twenty-seven of the 40 basic industry classifications reduced their frequency rates, and 20 reduced severity rates.

The accident frequency rate for employees in all industries submitting company reports to the Council, based on the number of disabling injuries per 1,000,000 man-hours, was 9.06 in 1951, a reduction of three percent from the year before.

The communications industry again led all others by turning in the lowest employee frequency rate. Its rate was 1.79, a 13 percent reduction. Electrical equipment ranked second with 4.04.

The accident severity rate for all industries reporting to the Council based on the number of days lost per 1,000 man-hours, was .97 last year, an increase of three percent from 1950.

Storage and warehousing reported a frequency rate of 9.07, down 9 percent from 1950 and a severity rate of 1.27, an increase of 84 percent from 1950.

THE ICE INDUSTRY

NATIONAL ASSOCIATION OF ICE INDUSTRIES

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President
Wm. J. Ayers, Memphis, Tenn.

First Vice-president
Paul H. Andres, Oklahoma City, Okla.

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E. L. Gunn Jr., Atlanta, Ga.

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Geo. Steers, Jr., Kalamazoo, Mich.

THIS MONTH IN BRIEF

Ten steps for improving the ice business are offered in a publication issued by the National Association of Ice Industries. It suggests that these steps will transform any ice business into a successful operation.

A Texas ice man tells about his experience with ice venders. With vending units located in twenty-four ice plants, and fifteen vending stations, this company provides ice service twenty-four hours a day.

Decreased production volume and increased costs led an Indiana ice distributor to an original plan of cooperation with local ice producers.

An optimistic picture of the ice business was presented in a recent company publication issued by the Calcium Chloride Institute. It reviews the new uses for ice and offers a favorable view of the stability of ice tonnage.

The Florida Ice Association in the third of a series of merchandising clinics, attracted ninety-five superintendents, route, and platform men, breaking all attendance records for similar previous conferences.

Want to Sell More Ice? 10 Steps For Improving the Ice Business

WITH another Ice season under way, a decisive one for many companies, it is time for every Iceman to take stock of his business. Is he doing everything in his power to sell more Ice this year . . . to render his customers better service, to improve the standing of his firm as a factor in its community? These questions are asked in a recent issue of Ice News, published by the National Association of Ice Industries.

Ten Steps

Serving only as a reminder, here are ten steps an Ice company owner should seriously consider as means of bringing his business up to date and transforming it into an alert, progressive operation. What's your score?

1. Set high standards of neatness and sanitation for your plant and delivery equipment. Clean up, paint up, fix up! Insist that your personnel stay presentable, too. Your customers judge you by your appearance.

2. Get into prepared Ice service. If you sell only block Ice, you are cutting yourself off from much of today's market. And make prepared Ice available in packages for both commercial and domestic trade. "The package sells the product."

3. Go after new markets opened for you by Ice research. Find out the possibilities locally for sale of Ice to meat, poultry and produce retailers, to fruit and vegetable growers, to florists, to truckers, to poultry processors, and, of course, to the domestic trade. Use the selling aids available to you from your Associations.

4. Advertise your services to the extent of your ability. Maybe you cannot afford to take half-page newspaper ads or produce four-color folders—but remember, there are such inexpensive media as classified telephone directory listings, radio spot announcements, book matches and other give-aways, classified newspaper notices, 2 cent postcards for mail campaigns, mimeographed broadsides, and your own trucksides. Don't overlook, either, the Association advertising materials which are now available to you free or at nominal cost.

5. Publicize your business. Take booth space at local home shows and other expositions; supply ice free for charity events (making sure you receive a credit mention); hold open house at your plant; submit news to the papers; set up unique holiday displays; furnish printed material to clubs and institutions or lend them the Ice film, Naturally Yours; conduct school contests with Ice-using appliances as prizes; offer your services as a speaker. Don't be above any "publicity stunt" in good taste.

Incentives for Employees

6. Give your selling employees incentives to work for. Hold annual contests with premium or cash bonus awards. Think up a novel method for marking the contestants' progress and indicating the current leader. Make the award presentations at some type of social event, preferably inviting the employees' families.

7. Have a plant and delivery safety program. Insist on the use of safety clothing and devices at all times. Post a conspicuous record of the number of days since your last employee accident. Use the circulars and warning posters available from insurance companies and safety associations. Present safety medals or awards.

8. Use your National and Unit Association services frequently. Read the bulletins and other publications—and keep them on file. Ask for individual assistance on your legal and legislative problems, technical obstacles, merchandising efforts, advertising or publicity projects. Attend the conventions if you can.

9. Invest in a vending station if it is at all possible. Vendors are not a means of getting rich quick, but they are recognized industry-wide as the answer to many problems of retail

distribution. They are convenient for your domestic customers, they have high advertising value, and—most important—they yield great savings over expensive home delivery.

10. Diversify. Adopt a sideline—or two, or three—for which there is a market in your community, and which will support and strengthen your Ice business. The opportunities are numerous. In addition to selling fuel and ice-using appliances, Icemen on record are keeping their operations in the black by retailing electrical appliances, curing meat, storing frozen foods and other perishable items, running grocery stores, and by selling bait and fishing equipment, pure water, and rose bushes. A complete list would include over 60 different sidelines that U. S. Ice companies are known to be engaged in.

Missouri Ice Plant Closed

THE ice plant at Jackson, Mo., operated by the Koch Mfg. Co. has closed. Machinery, dating back largely to 1908 when the plant was established by the Goodwin-Jayne Co., has been purchased by Andrew Kux, engineer, of Nogales, Ariz., who is furnishing ice manufacturing equipment to Mexican towns.

Growers and Retailers Hold Conference on Sweet Corn

A CONFERENCE on improved handling and merchandising of sweet corn was held recently at Cornell University, Ithaca, N.Y. In attendance were growers, county agents, material suppliers, ice distributors, and retail marketing authorities. John D. Hartman and George Johannessen of the University's Department of Vegetable Crops sponsored the program.

Principal speaker was P. James Mastin, Peoples Ice Company, Syracuse N.Y. Mr. Mastin told how corn loses its flavor, tenderness and goodness unless protected against high temperatures. He outlined experiments made in various states with different types of icing and packaging, concluding that wet strength paper bags seemed to fit the picture best for economy, ease of handling and protection.

"Many consumers don't know how good sweet corn really is", he asserted. "If good corn is provided to the consumer, more fresh corn will be sold. Iced corn is usually moved first by the retailer, indicating that consumers will gladly pay for the improved quality, so that it does not cost growers, shippers and receivers anything in the end."

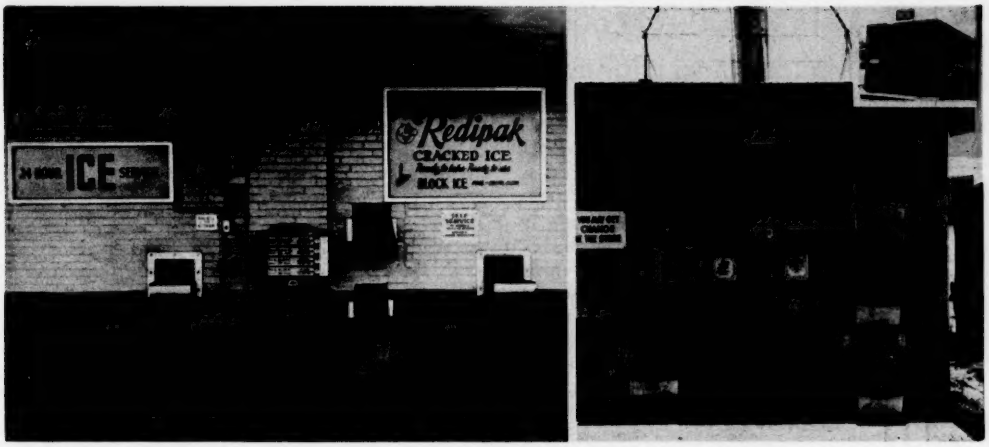
William F. Jacobi, market research department, Union Bag & Paper Corp. presented a film taken of the 1951 Illinois experiments, where the corn was shipped long distances, some of it from Carbondale and Anna, Ill., to New Orleans, hydrocooled, iced and packed in wet strength paper bags.

The bags, developed by Union Bag & Paper Corp., each held five dozen ears and 20 pounds of ice, and carried the corn to the retail outlet in top refrigerated condition. The experiment was made possible through the cooperation of the Production and Marketing Administration, USDA, and the Division of Markets, Illinois Department of Agriculture. Similar experiments have been conducted by Ohio State and Purdue Universities.

Other speakers and panel members at this all-day program unanimously agreed that continuous cooling of corn means better quality. . .and better quality is the key to greatly increased sales.

Speakers and panel members at the Conference on improved handling and merchandising of sweet corn. Front row: Louis Rossi, vice-president, New York Retail Growers Association; Joe Robson, Robsen Seed Farms, Hall, N. Y.; John Baker, Cayuga Producers Cooperative; Paul Cooke, American Stores Co.; P. James Mastin, Peoples Ice Co., Syracuse, N. Y.; Back row: George A. Johannessen, Cornell University; William Papke, grower, North Tonawanda, N. Y.; Henry Munger, Cornell University; William F. Jacobi, Union Bag & Paper Corp.; Maurice Bond, Cornell University; Earl D. Mallison, Atlantic Commission Co.; William Palmer, county agent, Kingston, N. Y.

Wet strength paper bag made by Union Bag & Paper Corp., for icing fresh sweet corn. An advertising campaign on this bag is scheduled to appear in publications read by more than 100,000 growers, agricultural leaders, ice distributors, and produce company executives, slanted to point out the stake each of these groups have in this modern way of handling sweet corn.



Ice vending installations of Central Power & Light Company. At left is a platform vendor and at right is a vending station at an outlying location. The inset at upper right shows how signs are used at vending stations to call attention of passers-by that ice is sold there.

Selling Ice Through Vending Stations

E. W. FRANKE
Central Power & Light Co., Corpus Christi, Texas

OUR experience with ice vendors has led us to believe that there are more people who like the service which they provide than those who dislike the inconvenience of servicing themselves. We are living in a self-service age and customers have become accustomed to such service.

Our company now has 136 vending units located in twenty-four ice plants, and 15 vending stations. At the plants we use a platform attendant during the busy hours of the day, only to avoid congestion at the platforms. One plant platform has not had an attendant in about five years, and another for two years. Both of these plants are in highly competitive areas and we have been unable to note any loss of business due to the fact that they were self service vendors. We have, however, convinced ouselves that using vendors for Redipak ice has increased sales materially even in locations where competition sells processed ice for less money.

Our top vending station last year sold 476 tons of ice, three quarters of which was Redipak ice, and brought in revenues in excess of $8,500. During the month of August last year, this station averaged a sale every 6.3 minutes of the month, and I would say that is about the maximum that one station can sell. Another of our top stations sold 404 tons of ice. Five others sold in the neighborhood of 250 tons. Some of our lower bracket stations are relatively new and their business is increasing gradually, and a few are going to have to be moved.

The important requirement of a successful vendor is its location. The survey prepared by the National Association is valuable in this connection, but using it is not an infallible method of securing a good location. All of our most successful stations are in very good to high class residential sections and sell a preponderance of Redipak ice, and we believe that most of this is plus business. Contrary to our original belief, stations in concentrated areas of lower class customers do not sell volume ice, and most of it is block ice. We installed one station in a Negro section that was closely settled, and one in a Mexican section that we felt certain would be very profitable. Both of these have been disappointing.

Another thing we have discovered is that people are very much creatures of habit. We have a location where we abandoned an ice plant and made a self service station out of the vault and installed three vending stations at what we thought were strategic locations in town, with the idea of abandoning the plant location as soon as our customers got used to purchasing ice at the more convenient station. Today, two years later, the plant location is still selling as much ice as the three vending stations combined. From this experience we would say, don't be in too big a hurry to move a station if it does not come up to expectations.

Last year we originated a program of painting the retail sections of our plant platforms and our vendor stations a bright yellow with a brown wainscoting, and using attractive signs with red lettering advertising 24-hour ice service and Redipack ice. This program was completed in the spring of last year and has added very materially to the appearance of our plant platform and vending stations. Vending stations that were rather difficult to see driving down the street are now very much in evidence. We are so pleased with this idea of having our equipment stand out that we have adopted the same color scheme for our trucks.

A survey of our managers indicated that most of them were sold on vendors, whether at the plant or in stations. A few were opposed to them and the indicated reason for their attitude was that the vendors were not properly installed and serviced in the beginning, causing customers complaints and a belief in the managers' mind that they will not give satisfactory service, so it is important to get started right and stay that way. The vendors on our top station probably completed in excess of 45,000 operations last year.

From address at annual convention of Southwestern Ice Manufacturers Association.

How We Met the Threat of Low Production Volume and Higher Costs

H. L. DITHMER
Polar Ice & Fuel Co., Indianapolis, Ind.

This new angle on how to meet the problem of decreased sales of ice which result in mounting costs per ton was related at the recent Indiana ice convention. It is a sensible arrangement of cooperation between competing ice companies, one assuming the manufacturing, and the other distribution details.

TWO years ago it occurred to us that low production volume means increased costs for ice and reduced income. We know from sad experience that it had happened to us. And we know that many other ice manufacturers in Indiana have had that same experience.

In one of the towns in which we operate, we had 90 tons daily of production capacity added because we raised prices to two manufacturers on their excess summer requirements. This created much idle machinery in that plant, which made us very sorry and very unhappy. Two two manufacturers also have much idle machinery and they also are very sorry and very unhappy.

And so, misery loving company, we started hunting other unhappy ice men. They weren't hard to find but they weren't unhappy enough. But after a year we struck pay dirt. We quoted a price to a manufacturer which we knew was less than his cost of manufacturing, even with all of his fixed charges added on to our price. We also knew that it was less than our own annual overall manufacturing cost per ton.

Cost Reduced

We sold him. The additional ice we made for this former manufacturer cost us at the rate of 37 cents per ton over our previous year's power bill. The hauling cost at 20 cents per mile approximately 50 cents per ton. Our overall cost of producing all of the ice was reduced $2.25 per ton. Even at the low price at which we sold this former manufacturer, we made more money per ton than on all the rest of the ice we sold through our normal channels.

In mid 1951 we started after this kind of business in earnest. In late May we gave our business in one city to a manufacturer. He closed down his plant and bought ice from us. We changed a $3700 loss in 1950 to a $145 gain in 1951. It would have been a much greater profit except for the big deficit accummulated in 1951 up to the date of the changeover. The former manufacturer is happy and you can bet your life we are.

On May 26 we induced another manufacturer to shut down and changed a loss in 1950 of $4900 to a loss in 1951 of $328. There again had we not accumulated a red figure up to the date of change and we had the advantage of making ice all year, our operation would have shown a nice profit.

Altogether, we have made six such contracts and all are entirely satisfactory to both parties. We are in the process of negotiating others ranging in annual tonnage from 500 to 7000 tons each. In each circumstance where the conditions warranted, we offered to buy ice from the other party at the same price at which we offered to sell him. That is only fair.

Faith is Required

It takes a lot of faith in the other fellow to agree to shut down your plant or dismantle it, not knowing how long you will be able to buy ice at favorable prices. We are highly complimented by and proud of the faith that has thus far been expressed in us and we do not intend to let those people down. And I don't believe that any one of those companies would let us down either, if we were buying from them, and if we could buy all our ice from them at the prices at which we are selling, we would shut down our plants and buy. Except for our escalator clause on power and labor rates that may have to be used, we intend to renew every contract as often as these people wish to.

This sort of arrangement will not work if your price per ton is too high. It must be less than the buyer's present manufacturing cost after he adds on to your price his fixed charges, the cost of refrigerating his storage room and all other expenses that he must retain that have previously gone into his manufacturing costs.

That price is of course dependent on the volume, the distance it must be hauled, who hauls it and the quantity hauled in one trip, as well as other numerous local factors.

I don't believe that a buyer need fear that anyone from whom he buys will endeavor to steal his business, because I don't believe that anyone is anxious to expand his activities in the delivery of ice, particularly if his market is some distance from the one in which the seller is located. In fact, I believe that there is enough integrity among ice men that in most cases a man would be perfectly safe in contracting for his supply of ice with a competitor who is located in the same city.

Some of the negotiations on contracts of this kind have taken more than 18 months to close. Some negotiations that were started more than 18 months ago are still in process of negotiation. I am hopeful that these experiences of ours will stimulate and expedite the decisions of others who may find themselves in drastic need of lower ice costs or lower production costs.

From talk presented at the Indiana ice convention.

Ice by Air Provides Drinking Water

DURING those swirling floods which surprised the midwest section of the United States last July, the stricken population of a certain Kansas area was in urgent need of drinking water. A relief crew, ready to fly it to them, found themselves suddenly faced with the problem of a container that would not spill or burst. While the adults shook their heads and wondered, a bright 12-year old came through with the answer, gleaned from his comic books: they dropped ice.

American Ice Accepts Land Settlement

THE $260,000 case against the government by the American Ice Co. for land taken on Heath St., Jamaica Plain, Mass., in September, 1949, as a site for the new 1000-bed veterans' hospital since erected and now about ready for use, has ended in a compromise in Federal Court. The company accepted an offer of $141,000 in settlement, the offer being subject to approval by the Attorney General of the United States.

Ice Makers Ready For Another Busy Year

An optimistic picture of the ice business was presented in a recent issue of The Calcium Chloride Institute News, published by The Calcium Chloride Institute. The viewpoint, expressed in the following, doubtless will be interesting to many ice producers.

ASK an ice manufacturer what he thinks his business will do this year, and he'll likely give you a reply similar to any farmer's answer to the same question—"Looks good but a lot depends on the weather."

Despite the provision the weather holds on the ice-makers' business, there's a good chance that business might surge ahead of last year. The lack of severe freezes in the South during last winter has supplied bumper crops, and many of them are on their way to market in refrigerated railroad cars and trucks.

One of the largest ice making plants on the East coast, Mutual Ice Company, in Alexandria, Virginia, has already welcomed a brisk increase in business so far this year. O. A. Reardon, plant manager, says "We think our business may increase 10 to 15 per cent this year over last." But he conditions his remark with respect to weather. A cool summer or an extremely warm winter can play havoc with an ice business.

Diversified Ice Uses

Mutual Ice Company operations are unique in that they service many of the refrigerator railroad cars and refrigerator trucks that carry produce from southern growers to northern markets. Mutual supplies ice for four main line railroads that run through the yards near their ideally-located plant, and almost all the refrigerated trucks that travel U. S. Highway 1. Mutual is the fifth or sixth re-icing stop for trucks heading North, and recent improvements in plant facilities enable them to service about 500 trucks a day.

Duties during this season of the year for Chas. Coblentz, Mutual's chief engineer, are typical of other ice plant engineers. He has recently completed spring maintenance work on the plant's refrigerating system which includes three tanks with 16,000 cubic feet total brine capacity.

Competition in the ice business is keen, and most ice-makers are not content with current markets; they are always on the lookout for new ways to merchandise their product. Latest trends along this line include three important new uses for ice.

New Uses for Ice

The first is the use of ice vending machines. Consumers drive in to their nearest vending machine, place a coin in the vender slot and pick up a bag of prepared or crushed ice, or a 25 pound block. This trend has eliminated the delivery of ice in many areas, and almost all East and West coast ice plants have made provisions for vending machines.

The second somewhat new use for ice is in hydro-cooling of produce. Sweet corn was the first farm product packed in wet strength paper bags and then delivered to nearby retail outlets; other products will be handled in the same manner. Corn has been iced in a similar manner before, but this is the beginning of its delivery to nearby outlets; formerly it was iced and shipped to metropolitan markets.

The third new stunt of the ice-makers is ice in mechanically refrigerated meat cases. National Association of Ice Industries reports favorable results of this use in about 400 markets on the West coast.

You may think the ice-makers have had to give ample room to increasing mechanical refrigeration in past years and that today ice production has been drastically cut. Truth is it's increasing with demand from many old and new uses. Twelve million homes still use ice; it's also used in about 380,000 food shops, 185,000 taverns, 55,000 drug stores, 25,000 hotels, 9000 florist shops, and 8000 fish and seafood markets. Toss in an important 7000 hospitals and you have a better picture of the demands for ice.

Practically all perishable produce goes to market via railroad cars or trucks. They need about 13 million tons of ice each year to keep their produce fresh. Another five million tons of ice are used annually in industrial cooling processes. These demands for ice keep the nearly 6500 ice plants in the U.S. fairly busy but not working to their utmost. Normally, their combined tonnages can easily reach the 50 million tons per year figure.

New techniques in ice making and increased efficiency of operation are important items to ice manufacturers; they are ever alert for ideas that might improve their product or their methods for making and merchandising it. Research in the industry has again this year brought into focus many new markets that will require tonnages above those already established as annual demands.

Railways Ice Company Sells Ice and Storage Plants

ANNOUNCEMENT has been made by Southeastern Public Service Company of the acquisition by its subsidiary, Railways Ice & Service Company, from Harold O. McLain of ice and cold storage plants located at seven midwestern and southwestern states, devoted primarily to the servicing of various railroads. Mr. Charles J. Gregory, President of Southeastern Public Service Company, stated that the addition of these facilities very substantially increased the ability of his company to service the icing of perishable products transported by refrigerator cars, an important element in the National Defense Program.

Report Issued on Meat-on-Ice Program

THE factual material on which the meat-on-ice selling program is based is now ready for distribution by the Research and Engineering Department of the National Association of Ice Industries. The final report has been completed and released by Dr. Floyd D. Carroll who conducted the research. It covers the findings on the use of ice in mechanically refrigerated butcher-type meat display cases. The project was sponsored jointly by the National Association and the Union Ice Company of California.

This study has attracted wide and favorable attention among retail meat dealers, and its results were spectacular. It received a great deal of publicity through meat and food trade publications. It is highly favorable to the use of ice in mechanically refrigerated meat cases, and many ice men are already putting the findings to profitable use. A single copy of the report will be mailed to ice distributors free upon request, and additional copies may be obtained.

This report presents facts which ice managers will find very helpful in convincing meat retailers of the value of using ice in their meat cases, as well as providing sales material for other uses of ice.

Information is now being compiled by the Department for an installation service and sales manual on meat-on-ice. This project will include full coverage of installation methods, servicing techniques and sales approaches. It is being organized so that practically everything that is now known about this boon to increased ice tnnage will be between two covers.

National Ice & Cold Storage Honors Employees

THE National Ice and Cold Storage Company of California, with general offices in San Francisco and branches located in many of the production and distribution areas of the state, has made its initial presentation of pins honoring employees with five years or more of service with the company at a luncheon tendered company executives, held at the Family club May 28 and at a luncheon for general office employees held at the St. Julien restaurant June 5.

The luncheon at the Family Club served the triple purpose of a bon voyage to F. O. Cooke, company president, who departed later that evening for a European trip and also as a testimonial honoring M. W. Young, vice president and general manager, who that day had completed 35 years of service with the company.

Pins commemorating five years or more of service with the company are being presented in a series of luncheons and dinners to 195 of the company's normal complement of 375 employees who have accumulated a total of nearly 3000 years of service, or an average of approximately 15 years each, 73 of them having length of service exceeding this average and up to 45 years.

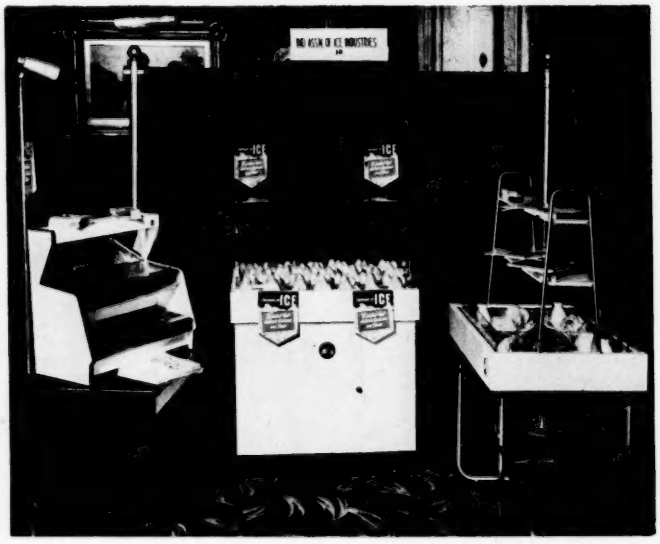
National Ice and Cold Storage Company was organized in California in 1891.

Ice Booth at Farm Show

WITH cooperation of the National Association of Ice Industries an interesting ice exhibit was part of the annual Country Life Program which over 33,000 visitors attended February 20-22 in Farmingdale, N. Y. The program is a regular activity of the Long Island Agricultural and Technical Institute.

The ice booth featured a produce display, showings of the film Naturally Yours, and the minature refrigerator icing model owned by the Miami (Fla.) division of the City Products Corp. The film was loaned direct from the National Association of Ice Industries.

Indiana Grocers See Modern Ice Cases



This attractive exhibit was shown by the Indiana Association of Ice Industries at the annual convention of the Indiana Retail Grocers and Meat Dealers Association held at the Claypool Hotel, Indianapolis, April 20-21. More than 1,000 grocers attended the event. The equipment in the exhibit, consisting of a miniature of a double deck supermarket ice case, a portable island icer, and a portable poultry and fish case with plexi-glass top was manufactured by Trusty Manufacturers, Laporte, Ind. The chickens were furnished by Swift & Co.

California Ice Companies Indicted for Monopoly

NINE California ice companies, one ice association and seven individuals were indicted in a secret true bill issued by a Federal grand jury at Los Angeles, Calif., on charges of conspiracy to monopolize interstate and foreign sales and distribution of ice and furnishing icing services. Voting of the indictment was announced June 11 at Los Angeles by William C. Dixon, Pacific Coast chief of the Department of Justice's anti-trust division.

The indictment charges the defendants with controlling sales aggregating $7,000,000 a year which represents approximately 80 percent of the ice business in California. In addition to the criminal indictment, a civil suit was filed seeking to dissolve the Ice Exchange, Inc.

Named in the indictment were Southern Counties Ice Company and Ice Exchange, Inc., Los Angeles; Union Ice Company, National Ice & Cold Storage Company of California; City Ice Delivery Company, Union Merchants Ice Delivery Company, Central California Ice Company, Fresno Consumers Ice Company, Valley Ice Company, all of San Francisco; and California Cold Storage and Distributing Company, San Diego.

Individuals named were: P. W. Easton, vice president and director of Union Ice Company and treasurer and director of Ice Exchange, Inc., Joseph T. Gabriel, San Bernardino; J. B. Dunbar, San Diego, and F. C. Coupe, F. O. Cooke, H. G. Hacke and Robert J. Bailey, of San Francisco.

San Francisco Ice Delivery Company Dissolved

CITY Ice Delivery Company has been dissolved after more than twenty years of service in the retail ice delivery field in San Francisco. The company was formed in 1929 by National Ice & Cold Storage Co., Merchants Ice Company and Consumers Ice Company to service the local retail trade.

National Ice & Cold Storage Co. and Consumers Ice Co. will continue the ice delivery operations formerly conducted by City Ice Delivery Co. Merchants Ice Delivery Co., the partner of City Ice Delivery Co., has withdrawn from the field.

Merchants Ice Delivery Co. was a wholly owned subsidiary of Union Ice Co. and Merchants Ice & Cold Storage Co.

Reports from Unit Ice Associations

California Association Holds Merchandising Forum

THE Northern Division of the Merchandising Forum of the California Association of Ice Industries met at Sacramento May 8. The meeting opened at approximately 3 o'clock in the afternoon and adjourned at 9:30 that evening. A buffet dinner was served during the evening.

The program covered three main topics: Corn Icing, Poultry on Ice and Meat on Ice.

Iced Sweet Corn

Methods and procedures used in handling fresh corn packed in ice in wet-strength paper bags were discussed. It was pointed out that the advantages of this type of packing fresh corn for shipment to market produces a slowing-down of the changeover of the sugar content to starch, a more customer-appealing appearance when the corn arrives at market because of the retention of the fresh green appearance of the husks, and last but not least the savings in shipping container costs of approximately 11 cents for a paper bag as compared to 38 to 40 cents for a crate.

Poultry on Ice

The subject of poultry-on-ice was well covered by representatives of Armour & Co. who had a display of dressed poultry, both chickens and turkeys, on ice. A paper "Why Ice Packed Poultry" was read by Hugh McErlane, an Armour representative.

Mr. McErlane said that the days of selling poultry New York dressed, that is with head and feet on and the viscera not removed, are fast disappearing. The housewife is rapidly learning that poultry, eviscerated in a sanitary plant, is much cleaner, has a better flavor and is more convenient. This is just as important, he said, as removing the viscera from a beef, lamb, or hog as soon as it is slaughtered. And the packing industry has learned that the practical place to process poultry is as near as possible to where it is grown, and plants are being located in the center of producing areas.

Regarding the use of ice, he said that to properly protect poultry that has been drawn warm, the animal heat must be removed promptly, and this can best be done with ice. After evisceration the birds are placed in metal vats, and covered with ice for two to four hours. They have found that ice not only refrigerates eviscerated poultry, and keeps it in a fresh state, but it helps to retain that fine fresh flavor. They have proven to themselves, to dealers, and to the housewives, he concluded, that the use of ice as a refrigerant, and as a medium to retain the moisture in poultry is practical, efficient, and economical.

From this paper and Mr. McErlane's supplementary remarks, it was abundantly clear that Armour & Company was thoroughly sold on the use of ice in connection with distribution and display of its fresh poultry.

Meat on Ice

The meat on ice portion of the program covered some early experiments conducted at the University of California at Davis. The principal findings of these experiments were that the display of cut meats on ice reduce shrinkage through loss of juice by 90 to 95 percent and practically eliminates the necessity for trimming caused by discoloration of the meat as it dried because of juice loss.

A recorded interview with a meat market operator who was using ice in a mechanical display case was presented. From his remarks it was very evident that he was sold on the meat-on-ice program. Another market operator present at the forum corroborated his statements. In both cases these market operators were in agreement with the findings which resulted from the experiments conducted at the University of California at Davis.

The market operator present at the meeting had been using ice as an adjunct in his mechanical refrigerated case for approximately a year and he said that as far as he was concerned ice would be used as long as he remained in business. In response to a question as to what additional profits he had experienced since using ice, he replied "more than I expected." Slides were shown demonstrating methods for using ice in mechanical refrigerated cases.

Approximately 75 persons attended the forum, including some 20 new independent distributors who were vitally interested in the subjects covered. These distributors were enthusiastic over the day's program and it is anticipated that many of them will become members of the California Association of Ice Industries.

New England Ice Association

THE ANNUAL meeting of the New England Ice Association was held at the Kenmore Hotel on May 8 with 40 present. The meeting was a one-day affair, due to the small number who signified their intention to be present.

A very interesting presentation on meat icing was given by R. J. Mastin of the People's Ice Company, Syracuse, N. Y.

James J. Bolger of the Union Bag & Paper Company spoke on the subject of corn icing. He showed a very interesting picture and presented the bag which his company is promoting for the use of packaging corn.

Directors' Meeting

Following adjournment of the annual convention, a meeting of the Board of Directors was held. Due to the fact that the secretary is no longer connected with the ice business, arrangements were made for him to carry on the work of the association on a part time basis.

The following officers and directors were elected:

President, Peter F. Hogan, Springfield, Mass.

Vice-presidents, Ralph Getchell (Maine); Richard Painchaud, (New Hampshire); Leon Whitman (Vermont); Moe Widrowitz (Connecticut); Ed. Kinney (Mass.); and George Breen (Rhode Island).

Treasurer, Charles Larsen, Somerville, Mass.

Directors: Fred Murphy, Norwalk, Conn.; Don Elliott, Georgetown, Mass.; Frank Gibbs, Indian Orchard, Mass.; Warren Pierce, Harwichport, Mass.; John Hill, Natick, Mass.

Billboard Advertising

A NUMBER of Indiana ice companies are giving billboard advertising a trial. A minimum order for both large and small billboard poster sheets has been underwritten by them in an initial attempt to precipitate a statewide billboard advertising program. Poster sheets were purchased through the association, and billboard space will be arranged for locally. The first of a series of an anticipated four posters is now ready.

This billboard program, an outgrowth of discussion at the annual convention, is just getting started in Indiana, and it is hoped that additional companies will join in this excellent medium of advertising.

Part of group of enrollees and instructors at Merchandising Meeting, sponsored by Florida Ice Association

Florida Ice Association Holds Merchandising Meeting

THE concerted efforts of The Florida Ice Association and its Merchandising Committee paid off when attendance records were broken at the third in a series of sales clinics. The ninety-five superintendents, route and platform men who attended the meeting in Miami, May 29, verified the fact that Florida ice plant owners are becoming increasingly conscious of the necessity of training their employees in better public relations methods.

Opening of Meeting

R. A. David, president of the Florida Ice Association, opened the merchandising meeting in the banquet room of the Seven Seas Restaurant. The room was attractively decorated with large ice banners, Swift's "Dream Chickens" displayed in an iced poultry case, a beverage chest filled with iced cokes, picnic chests (the hostess for the Seven Seas bought the largest) a small demonstration case and many hand-out pieces of literature.

The inimitable Dr. Frank Goodwin, of the University of Florida, proved he was a super-salesman by holding every man's undivided attention for 50 minutes. His analysis of the importance of the employees' personal appearance, attitude and treatment of every customer, every day was extremely interesting and thought-provoking.

M. B. McDonald, director of publicity and advertising for the Florida Power & Light Company, told how a courtesy program, started for members of the company had become a Florida project. He described the cash value and international recognization Florida, as well as his organization, had received as a direct result of the drive.

"The Police Departments in Miami and Jacksonville and smaller communities in the state have adopted the policy and reported courteous treatment of visitors to our state, as well as the home-town folks, really does help in the observance of laws and the building of good-will" the FPL executive stated.

Meat-On-Ice

The slide films on Meat-On-Ice, first shown at the National Convention in Houston, Texas, with explanatory remarks, was the next feature of the program. W. L. Lohman, salesman with City Products Corporation, Miami, followed with the approach he had used in presenting the Meat-On-Ice program to meat market owners and operators. Paul Jarvis, also with City Ice, Miami, gave an actual demonstration of the icing of a meat case and cited some problems he had encountered and worked out along this line.

"Sarge" O'Neill, meat merchandising manager for the Food Palace in Miami Springs, Fla. "stole the show" with his enthusiastic discussion of what ice had done for the red meat he handled and his increase in sales.

Mr. O'Neill stated their super-market featured only famous brands of red meat and poultry and since using ice they were able to present these products to their customers at the peak of their goodness. He further related how their steaks and roasts stayed red, moist and "cheerful" looking about four times as long as before they started using ice.

Dr. Lowell Yoder, with the College of Business Administration, University of Florida gave an interesting talk on the right approach in merchandising.

The first half of the meeting was closed with the showing of a short-television program sponsored by The City Products Corporation.

George W. Wright with Royal Palm Ice, Miami, opened the second half of the conference with interesting observations on a subject close to the heart of ice-men, route building.

Under the able guidance of John Causey, chairman of the Merchandising Committee of the Florida Ice Association, a series of sales skits were conducted.

Little Ice Makers

J. W. Bill McCollister and R. A. David gave Roger Herndon, executive vice-president of the Florida Restaurant Association, many good reasons why he should not purchase an "on premises ice making machine" for his restaurant and demonstrated the superiority of ice-man's ice. Mr. Herndon was a hard man to convince however, and enrolees were given first hand knowledge of sales resistance and the best course to follow in contacting restaurant owners.

George Warren, with City Products, convinced Harry J. Redwood that the installization of an iced produce case would not only increase his sales of vegetables and fruits but act as a drawing card and increase sales of other grocery items.

Jack Holland, in charge of poultry sales for the Miami branch of Swift & Co., gave a splendid talk on the reasons why—Swift & Co. insisted their poultry be kept on ice and pointed with pride to the display of their chickens on sparkling ice.

Dr. Frank Goodwin in closing the meeting gave simple rules that could improve every ice man's "Sales Personality."

Division of American Warehousemen's Association

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Executive Vice-president
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Secretary
JOS. H. COLQUITT, WASHINGTON, D.C.

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Treasurer
CHAS. B. HART, TACOMA, WASH.

THIS MONTH IN BRIEF

The thirtieth annual convention of the Pacific States Cold Storage Warehousemens' Association was held at Santa Barbara, California, April 14-16. Technical aspects of refrigerated warehousing, warehouse receipts, the Public Utilities Commission, and other subjects were discussed.

A portable mechanical lift for high piling and breaking out high-piled boxes of apples has been constructed and placed in experimental operation by the Research Department of the Washington State Apple Commission.

A report on the rights of warehousemen under warehouse liens was presented by the Committee on Lien Rights at the annual convention of the Association of Refrigerated Warehouses.

Cooler and freezer space in public refrigerated storages were 61 and 77 percent occupied, respectively on May 31. This was an increase of two points for coolers and freezer occupancy was up one point.

Pacific States Cold Storage Warehousemen's Association Thirtieth Annual Convention

THE 30th annual convention of the Pacific States Cold Storage Warehousemen's Association was held at the Santa Barbara Biltmore Hotel April 14, 15 and 16, 1952. The meeting was well attended and the delegates found the program interesting and worthwhile.

Warehouse Receipts

It was reported that the Society of Insurance Brokers had approached the association with the problem that warehouse receipts do not in every instance carry information as to the exact location where commodities are stored and that where goods are moved by a warehouseman from one building to another, or from one insurance-rated section of the building to another the storer is not always informed of this change. They pointed out that without this information the storer is unable to cover properly his goods by insurance.

This question was discussed at length and it was the consensus of the delegates that every effort should be made to find a solution to this problem. It was the feeling that a possible solution would be the establishment of an average rate by the insurance companies which would be applicable to a warehouse company having under its control several different-rated buildings and sections within a single municipality. The association office was requested to explore this matter further with the Society of Insurance Brokers in an effort to determine whether such a weighted average rate could be made available to the industry as a whole.

The question whether the California Warehouse Receipts Act should be amended so as to protect clearly the warehouseman's lien for accumulated storage charges on commodities delivered on an open-account basis was dismissed in detail. It was the consensus that an amendment whereby the lien on delivered goods would be shifted to balances remaining in storage is desirable and in the interest of the industry. The association office was instructed to proceed through proper legislative channels with the amendment as outlined above.

Technical Aspects

The technical aspects of the program were covered by four speakers who are outstanding experts in their individual fields of endeavor. Dr. H. C. Diehl, director of The Refrigeration Research Foundation, presided.

Dr. L. L. Morris, College of Agriculture, Davis, Calif., presented an outline of what is being done at the University in research in the transit and storage of vegetables. He stated that the activities of the University in this respect related to basic studies of the effect of temperatures on truck crops. He pointed out that the studies are conducted in controlled-temperature chambers at the University, as well as in certain commercial establishments. The end result of this research is the evaluating of the effect of temperatures on specified commodities.

Specifically, Dr. Morris described recent studies in connection with cold-sensitive vegetables such as cucumbers, squash, egg plant, green beans, tomatoes, sweet potatoes and melons. Colored slides showing the effects of different temperatures on these commodities were presented. The experiments in connection with this group of vegetables clearly showed that the commodities should be stored at above 50 F. These cold-sensitive vegetables when held at temperatures below this mark showed pitting, deterioration, and other harmful effects.

It was also shown that when such vegetables were held in storage at temperatures below 50 F they were subject to rapid decay upon removal from storage facilities. He also discussed the benefits of cold storage for that large group of crops classified as other than cold-sensitive. Dr. Morris pointed out that the Univer-

sity of California is continuing its basic reseach on all vegetables and further reports would be available from time to time.

Cooling Grapes

A. L. Ryall of the United States Department of Agriculture at Fresno presented an excellent talk regarding the effects of packaging materials on the cooling rate of grapes. Here again, the results of this interesting research program, conducted under controlled temperature and air-velocity conditions, were presented to the group through the means of slides. The experiments conducted by the USDA at Fresno in regard to the foregoing revealed the differences in cooling rate of grapes encountered when packed in certain types of boxes and where pads, curtains and liners were employed in the packing.

The experiments conclusively showed that the cooling rate where pads alone were used was extremely greater than where pads and liners and pads and curtains were employed. One of the findings in these experiments was that high-velocity air circulation was the important factor in the cooling rate, despite the fact that that there were constant variations in the cooling times where various packing materials were employed. Mr. Ryall contended that high-volume air circulation did not damage the commodity, but on the contrary was beneficial since less weight loss was encountered when the commodity was rapidly chilled.

A full report on this experimental study will be published in an early issue of ICE AND REFRIGERATION.

Controlled Fluctuating Temperature Facilities

Edison Lowe of the Western Regional Research Laboratory, Albany, Calif., gave a very detailed and enlightening talk concerning the design of controlled-fluctuating temperatures of storage rooms which have been installed at the laboratory for research in the frozen food field. These new controlled-fluctuating temperature facilities were described by Mr. Diehl as the finest in the world today. Mr. Lowe in his explanation of these facilities left no doubt in the minds of those present of the correctness of Mr. Diehl's statements. Arrangements will be made during the fall of this year for association members to make a personal inspection tour of these facilities.

H. C. Diehl, director of the Refrigeration Research Foundation brought the meeting up to date on the actions being taken by that body to further advance the employment of refrigerated storage for commodities which have not heretofore been warehoused under controlled temperatures. He pointed out that the life of storage batteries is increased tremendously by the employment of refrigeration and that this field of storage is a very promising one.

He explained numerous other projects which are now being sponsored by the Foundation in connection with the storage of frozen milk, evaporated milk, beer, bulbs and plastics. He pointed out that much work has been done in regard to the fisheries' field, particularly with the finding of new seafood which lends itself to the commercial market and which at the same time reacts favorably to holding under refrigerated conditions. He left no doubt in the minds of those present as to the tremendous service the Research Foundation is rendering to the cold storage industry.

Public Utilities Commission

Gen. R. E. Mittelstaedt, president of the California Public Utilities Commission delivered an excellent talk concerning the activities of the California Public Utilities Commission. He pointed out that the authority of the commission springs from the state constitution, implemented by legislative enactments, and that its activities affect every citizen of the state in an infinite number of ways.

The commission is both an administrative tribunal and a court of record and has broad power over the construction or extension of facilities, the accounting, financing, rates and service of transportation agencies and other public utilities such as gas, electric, telephone and water companies. The purpose of the commission is to secure to the public adequate service at rates which are fair and reasonable, both to the public and to the utilities.

The Transportation Department has general supervision over the 80 cold storage warehouses operated by 53 companies and 423 dry storage warehouses operated by 291 companies. Three companies operate both types of warehouses. The greatest concentration of cold storage warehouses is in Los Angeles County, which heads the list with nineteen, including eight within the city limits of Los Angeles. Santa Clara County is second with seven cold storage warehouses, while Fresno has five and there are four each in Sacramento, San Francisco, and San Joaquin counties. In all, there are cold storage warehouses in 26 of the state's 58 counties.

Warehousemen located in the five cities with more than 150,000 population; that is, Los Angeles, San Francisco, Oakland, Long Beach and San Diego, make up the group which must obtain certificates of convenience and necessity. They also must submit quarterly reports to the Commission showing the amount of warehouse space available and the amount occupied at the end of the quarter.

As of December 31, 1951, Los Angeles had 373,000 square feet of space available and 340,000 square feet occupied, showing 91.1 percent of occupancy. For the state, the total available was 962,000 square feet with 787,000 occupied, or a ratio of 81.8 percent.

In 1950 the total available space was 869,000 square feet and with 705,000 square feet occupied, the percentage of 81.1 was almost the same as last year, but the amount of space available and the amount occupied at the end of 1951 were approximately 11 percent greater than at the end of the previous year.

An indication of the stability and quality of the warehouse industry is the fact that the Commission very seldom has any complaints in regard to its operations. Another thing which pleases the Commission is that there have been no general increase in cold storage warehouse rates during the past 15 years. The lack of major rate increases leads us to believe that development of better and cheaper equipment and more efficient operations due to the gradual accummulation of "know-how" has kept pace with increases in other expenses. The speaker complimented the cold storage warehouse industry most highly on this achievement.

Filing Complaint

Formal complaints may be filed with the Commission, seeking redress for unlawful acts of omission or commission on the part of any utility. They may be filed by the Commission, on its own motion, or by any person, corporation or organization subject to injury thereby. Where complaint is against the reasonableness of the rates of a utility, it must be presented by the head of a political body or by not fewer than 25 consumers or prospective consumers.

Adequate opportunity is given the utility charged with the violation of its public duty to defend itself and for any of the interested parties to obtain complete review of the decision by appropriate petition to the

State Supreme Court. Provision likewise is made for adjustment of overcharges and for disposition of excess charges collected during the time an action is pending.

Resolutions

Resolutions were presented and adopted expressing appreciation to the speakers and others who had had a part in the very interesting program, also to President Millard W. Young for giving so unstintingly of his time and ability to the welfare of the industry during the past year.

Appropriate resolutions were adopted in memory of Jack Stauffer and Robert Brennan.

Officers and Directors

The following officers and directors were elected for the current year:

President, Millard W. Young, San Francisco.

Vice-presidents, A. R. Carstensen, Sacramento; G. F. Dodson, San Jose; Jack McGoldrick, Seattle, Wash.; V. V. Ogburn, San Francisco; Treasurer, H. G. Hacke, San Francisco.

Executive Manager, Jack L. Dawson, San Francisco.

Directors: L. A. Arata, San Francisco; Paul Ashley, Fresno; A. R. Carstensen, Sacramento; Hyland Hinman, Oakland; H. J. Nissen, Los Angeles; Wm. Giacomazzi, Jr., San Jose; David Rasky, Burbank; M. H. Schinnerer, Long Beach; J. G. Snow, Los Angeles; L. J. Urban, Los Angeles.

New York State Association Elects New Officers

AT ITS 39th annual meeting held in Rochester, N. Y., May 23, the New York State Association of Refrigerated Warehouses elected the following officers for the coming year: Garth Shoemaker, president; Richard Doncaster and W. M. Rider, vice-presidents; W. M. Scott, secretary; R. C. Stokell, treasurer. J. R. Shoemaker was reelected chairman of the Legislative Committee.

Training Conference

A TRAINING conference for refrigerated warehouse employees will be conducted under joint sponsorship of the National Association of Refrigerated Warehouses and The Refrigeration Research Foundation at St. Louis, Mo., February 2-5, 1953. Details of the program and other details of the conference will be announced later.

Opposes Government Seizure of Steel

AN ELOQUENT plea for basic American principles was made by Harlan J. Nissen, Terminal Refrigerating Co., Los Angeles, in a recent letter to members of the House Judiciary Committee opposing President Truman's seizure of the steel industry.

"I am writing you as an American citizen, protesting the Truman steel seizure," Mr. Nissen's letter reads in part. "My father fled to this country from Selsvig 70 years ago to avoid German persecution. I and countless other Americans have that same fear today because of Mr. Truman's action. Government seizure of a business is a pretty serious thing. If it can happen with a big company, a principle is established. It can happen to a little company too. This never can be a healthy country if its citizens live in fear. Fight as you have never fought before against this vicious seizure."

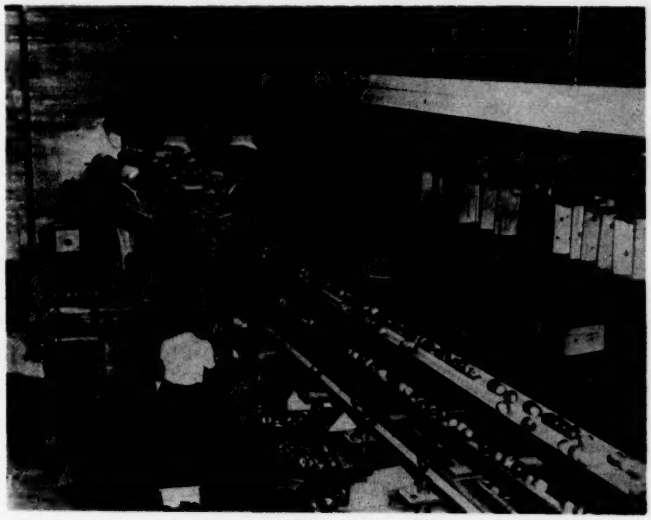
Radiant Heating Warms Floors in Fruit Storage

HOW DO you keep employees contented when they have to work in an icebox? That was the problem confronting operators of the Cashmere Fruit Growers' Union plant at Cashmere Valley, Wash. Their solution points the way for others who have trouble maintaining personnel efficiency and comfort in refrigerated rooms.

To keep fruit in picked-fresh condition, temperatures in the Union's buildings must be held at approximately 50 F. Because of this, workers in the processing areas caught frequent colds. In addition, they constantly complained of cold feet.

A solution was reached when the operators installed rediant heating coils of wrought iron pipe beneath the floors of their work areas. Steam is circulated through the coils. The result is that employees are kept comfortable, even though the radiant heating system has little effect on the temperature of the air in the building.

The Cashmere Fruit Growers' Union has a membership of some 80 growers. Its yearly output is approximately 600,000 packed boxes of apples and winter pears, plus 1,500 tons of cannery Bartlett pears.

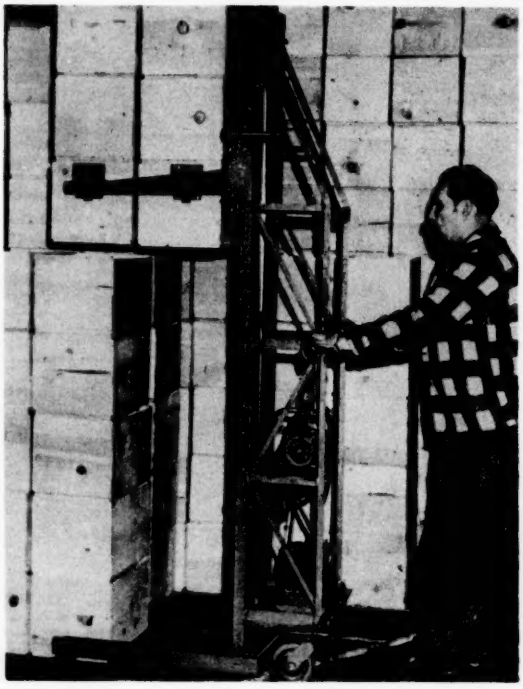


Packing room workers of the Cashmere Fruit Growers' Union, Cashmere Valley, Washington, keep warm and comfortable in spite of air temperatures of approximately 50 degrees F. The reason lies in a floor radiant heating system of wrought iron pipes through which steam is circulated. Since the air is not heated appreciably, there is little interference with the plant's refrigeration system.

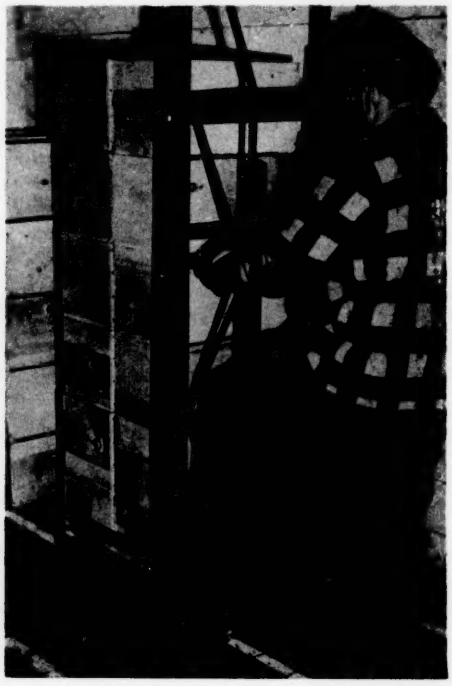
Portable Mechanical Lift Saves Handling Costs in Apple Storage Houses

A PORTABLE mechanical lift for high-piling and breaking out high-piled boxes of apples has been constructed and placed in experimental use by the Research Department of the Washington State Apple Commission in cooperation with the United States Department of Agriculture. This lift mechanism utilizes clamps for gripping or squeezing the lower boxes in stacks to be lifted. It operates hydraulically from an electric motor powered from a storage battery. The current cost of the mechanical lift, which is now in commercial production, is about $600 plus the cost of storage batteries.

The manual method of high-piling boxes of fruit involves the use of either two or four workers. When a two-man crew is used, a worker on the floor lifts and hands to a worker on top of the stack one box at a time for positioning in the stack. With a four-man crew, the workers are stationed two on the floor and two on top of the stack. Time studies show that when field boxes of apples are received at storage houses with the belt-conveyor and hand-truck method and are stacked 12 high, about 40 percent of the total labor required for receiving is used for manually high-piling the upper 6 boxes in the stack.



Stacks of apple boxes being raised with mechanical lift for placing on top of original five-high stacks.



Mechanical lift picks up two six-high stacks of apple boxes.

Mechanical Lift Reduces Labor Costs

On the basis of test runs with the mechanical lift, estimated costs labor and equipment) for high-piling 1,000 boxes of fruit in 12-high stacks were $3.17, compared with a cost of $7.08 by the manual method. The costs for breaking out 1,000 boxes of fruit from 12-high stacks were $1.51 by use of the mechanical method and $6.04 when the manual method was used. These costs were computed by using assumed wage rates of $1.25 per hour. Equipment costs, including both the cost of ownership and cost of operating the lift, used in these computations were 53 cents per hour for high-piling and 34 cents per hour for breaking out high-piled boxes.

These costs should be used only in comparing the relative efficiency of methods. They are not intended to reflect actual costs in the plants in which the methods were studied.

It is estimated that a 250,000-box apple house which uses the clamp-type two-wheel hand truck alone or in combination with conveyors for receiving and other handling operations, could save roughly $1,750 annually by shifting from the manual method to the mechanical lift method. It is also estimated that in Washington State alone between 125 and 140 apple packing and storage houses could reduce their handling costs from $70,000 to $100,000 annually and free 200 to 400 workers for other work during the harvest season by use of the mechanical lift. Moreover, there should be less bruising and deterioration of the fruit from handling with the mechanical lift than with manual handling.

Lien Rights of Warehousemen

THERE are several phases of a warehouseman's rights under warehouse liens. First, there is the question of delivery, handling, and storage charges. In this instance it is well to remember that under the law we are protected but we must also see that we protect our rights. Where charges are owing we should see that they be kept, if possible, on a current basis. When merchandise is withdrawn from the warehouse we should see that charges are not in arrears. If we permit all merchandise in storage to be withdrawn by a customer without collecting charges owing at the time of the withdrawal then we cannot place our lien on any merchandise which we may receive several days afterwards, or in other words if we refused delivery of the new merchandise without the payment of the old charges we would be in trouble.

Furthermore, we should be very careful in accepting orders from a financial institution stating "please deliver to John Jones upon payment of all charges owing," because if we deliver the merchandise without collecting the charges we could be forcing a problem.

Second, you have the right to refuse to transfer merchandise without first demanding all charges owing because a transfer is a delivery. We had a case involving several large transfers of merchandise and two days after receipt of the transfer orders this particular customer went into financial difficulties. We had refused to transfer this merchandise without the payment of all charges owing and these two cases were taken to Court. We won both decisions and our contention was upheld, and both Courts ruled that we were within our rights in refusing to make the transfers without all charges being paid first.

Collateral Loans

Next we come to the question of a warehouseman's rights on the making of collateral loans.

When a loan is made by a warehouse we should see that the merchandise offered as security for the loan is free and clear of all liens. Also it is well to remember that merchandise which has not been pledged, and is not shown on the negotiable warehouse receipt as pledged cannot in the event of bankruptcy become a part of the pledged loan because in the event of the borrower going into bankruptcy and under the provisions of the bankruptcy act it creates a preferential transfer which is voidable by trustee of the the bankrupt for the benefit of the bankrupt and its creditors. Our only rights in such a case are for charges owing on the unpledged merchandise.

We should also check into the question of trust receipts to see that they are not outstanding in the hands of some financial institution to which they may have been given prior to our making a collateral loan. Therefore, it is recommended that when an application for a loan is made, the applicant should execute a warranty title to the merchandise representing that the applicant is the sole and complete owner of the merchandise without any liens or incumbrances thereon whatsoever. While this warranty and representation would not offer full protection to the warehouse, it might give rise to criminal action aganst the applicant in the event it was later found that a lien superior to the warehouse lien was in existence at the time the loan was made and the collateral pledged. The best protection in making collateral loans would be to keep the loan value percentage of merchandise specifically pledged as collateral security at a low point so that under any and all conditions we would be assured of the repayment of our loans upon the forced sale of the specifically pledged merchandise.

There have been, or will be, submitted to the legislative bodies of the various states the Uniform Commercial Code which has been under study for some time and we fully recommend that everything be done to have it adopted.

Report of Committee on Lien Rights at annual N.A.R.W. convention, by J. E. Storer, chairman, Paul V. Henningsen, and Earl E. Hesse.

New Jersey Association Elects Officers

AT the recent annual meeting of the New Jersey Association of Refrigerated Warehouses, Ralph C. Stokell and William Muller were presented with "life membership scrolls" by C. E. Eells and John Hollmeyer in tribute to the many contributions they have made over the years to the industry in New Jersey.

Newly-elected officers of the New Jersey group are: President, Harold C. Emerson, Bridgeton, N. J. vice president, John Hollmeyer, Jersey City secretary-treasurer, Robert E. Baker, Camden. New members of the executive committee are Conrad Proebstle, Atlantic City and Gilbert Aubenblick, Jersey City.

USDA Purchases Shell Eggs

THE U. S. Department of Agriculture, May 29 purchased 10,380 cases of shell eggs under the surplus removal program announced April 9 and extended May 21 to continue through the month of June. Total purchases now amount to 78,370 cases. Deliveries of the eggs purchased will be made as follows: September 2, York, Nebr., 2,880 cases; Lincoln, Nebr., 2,880 cases; Chicago, 960 cases; and Omoha, 1,200 cases; October 1, Minneapolis, 1,500 cases; Chicago, 960 cases.

The purchases were made with "Section 32" funds provided by Congress to encourage consumption of agricultural commodities by diverting surplus quantities from normal channels of trade. The shell eggs will be distributed this fall to non-profit school lunch programs and other eligible outlets.

Army Contracts Should be Renewed

THE refrigerated warehousing army contract expired June 30. The National Association of Refrigerated Warehouses points out that this contract is of real benefit to all warehousemen and should be renewed because: (1) it operates only in an emergency and the warehouseman is not obligated otherwise. (2) During an emergency, warehousemen are obligated to the extent of 25 per cent of their available space only, while a refrigerated warehouse with no contract is subject to complete utilization by the military if the latter needs space in that particular area and wishes to exercise the war powers which are permissable under those circumstances. For these reasons, it is suggested that it is only good business to have a contract—whether or not Army commodities are in storage at the present time.

Canada Boosts Subsidies For Warehouse Cooperatives

THE Canadian government plans to boost grants made toward construction of some agricultural warehouses and cold storage plants. Under existing legislation, the federal government contributes up to 30 percent of the cost of warehouses or cold storage plants erected by cooperatives or others for the use of farmers. Under the new bill, the federal grant will be 33⅓ percent.

Warehouses Not Involved In Grain Storage Scandals

A RESOLUTION calling for immediate publication of the fact that public refrigerated and merchandise warehouses are not involved in the current scandals concerning grain storages was adopted by the membership of the American Warehousemen's Association at its annual convention in New Orleans May 8.

"It is highly important that the public understand that the irregularities involving grain elevators and on-the-farm storages do not in any way reflect discredit upon the public refrigerated and merchandise warehouses of America," said A. B. Efroymson, newly elected president of the National Association of Refrigerated Warehouses.

Mr. Efroymson went on to say that the public warehousing industry's record is one of exceptionally good character and that warehousemen pride themselves on the fact that the industry has always "policed itself from within", by insisting on ethical business conduct.

The "declaration of conscience" resolution directed the AWA officers to communicate the industry's stand at once to members of the House Committee on Agriculture, members of Congress, and all Governmental bureaus concerned.

The text of the resolution reads as follows:

Resolutions

WHEREAS, the American Warehousemen's Association is the recognized spokesman for the public merchandise and refrigerated warehouse industry in the United States,

WHEREAS, the American Warehousemen's Association is now in its 62nd year of continuous service to this industry and the public which it serves,

WHEREAS, the House Committee on Agriculture is presently conducting an investigation of irregularities and scandals involving warehouses,

WHEREAS, these irregularities and scandals have principally involved grain storage warehouses, generally known as grain elevators and on-the-farm storages,

WHEREAS, the general public and members of Congress are not usually cognizant of the difference between this type of storage and the type of storage conducted by public merchandise and refrigerated warehouses:

Therefore, be it resolved that the American Warehousemen's Association, whose membership consists of recognized public merchandise and refrigerated warehouses, in convention assembled at New Orleans, Louisiana, May 4 to 8, 1952, inform the House Committee on Agriculture and the Senate Committee on Agriculture, all members of Congress of the United States, and all Governmental Bureaus concerned, that insofar as is known, no public merchandise or refrigerated warehouse has been involved in any of these irregularities or scandals, and, in the event that any member of this industry is involved, the American Warehousemen's Association emphatically condemns such activity as contrary to the precepts and principles of this Association.

New Cold Storage and Freezing Plant in Istanbul

WITH a designed capacity of 650 tons of frozen meat, 1,200 tons of frozen fish and 500 tons of fresh fish, the first cold storage plant in Istanbul will be constructed at Besiktas, a suburb on the Bosphorous, according to "Foreign Trade" organ of the Canadian Department of Trade and Commerce. Formal corner stone ceremonies were held at the plant in March.

The daily capacity of the new installation, it is reported, will be 40 tons of fish and 100 tons of ice. The construction of this plant marks the inauguration of a program for meat and fish storage and processing being sponsored by the Mutual Security Agency. A second cold storage unit is proposed for Haydarpasa, opposite Istanbul on the Asiatic shore, to store meat brought from Eastern Anatolia and particularly the Erzurum region.

Freezer Ships For Alaska Salmon

RECORD number of freezer ships are being turned out in the yards of the Puget Sound region around Seattle, Wash., and nearby cities, for the current 1952 Alaska salmon season under way. About twenty freezer ships are to be headed into the Alaskan waters this season desipte the widening rifts and discussions over the merits of the "can 'em fresh" and the "can 'em frozen" proponents of these two methods of salmon and seafood packing.

The record trail from the Puget Sound shipyards turns the spot-light squarely upon the flexibility and maneuverability of the freezer ships, which shows up the adaptibility and advantages in these days of strikes, labor demands and consequently lower margins of profit of delivering the cargo to the best markets.

Merchandising Poultry and Egg Problems Studied

THE major bottlenecks in poultry and egg merchandising — and what to do about them—came in for some careful study at the recent meeting held by the Merchandising Committee of the Institute of American Poultry Industries.

Summing up the high-lights of the meeting, attended by merchandising experts who head up poultry and egg selling operations that stretch from one end of the country to the other, committee chairman George Vail of the Birds Eye Division of General Foods, said: "Better planning on the production end will smooth out some of our merchandising problems, just as better planning on the merchandising end is going to help stabilize the producer's market.

The Institute plans to make ad copy, point-of-sale material and other smaller firms establish brand names. This will give consumers more protection, keep processors in closer touch with consumer reactions, encourage greater uniformity, and help meet competition from low-quality products.

Some of the projects, we have under consideration now, Vail continued, "include nationwide rallies in which advertisers in our industry could tie in with those in related fields . . . demonstration campaigns in test markets . . . promoting barbecues for business clubs and other groups that generally hold summer outings by furnishing them with the barbecue equipment, recipes and supervisory services . . . sponsoring market research to find out more about what consumers and retailers are getting now, what they want, and whether present facilities are adequate to provide what they want . . . and awards for outstanding poultry and egg advertising and promotion." He indicated some of the projects will get underway within the next few months.

As Cliff D. Carpenter, Institute president, pointed out, "Better merchandising hold a lot of promise for the poultry and egg industry. It's one of our major activities and we expect to do as much to help it along as we can, as fast as we can."

Tax Amortization

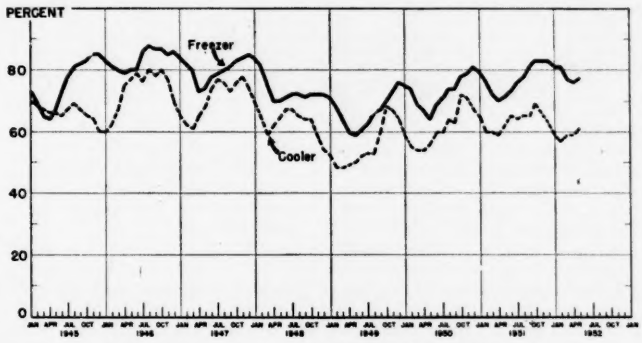
A CERTIFICATE of necessity for accelerated tax amortization has been granted to the Union Storage Company, Erie, Pa. Amount certified was $150,000 for public cold storage facilities, of which approximately 47½ percent was allowed.

May 31 Cold Storage Holdings

ACCORDING to reports received by the United States Department of Agriculture, cooler and freezer space in public refrigerated storages were 61 and 77 percent occupied, respectively, on May 31. During May, cooler occupancy increased 2 points which was about equal to the average change for this time of year; however, the 61 percent occupancy was greater than average for May 31 but less than last year. In all areas except New England and South Atlantic, warehousemen reported a greater utilization of cooler space than April 30 and in the East and West north Central States the reported gains were larger than the other regions.

Freezer occupancy on May 31 was a point above the previous month and at 77 percent was 6 points higher than last year and 9 points greater than the May 31, 5-year average. Not since 1946 has freezer occupancy been as high on May 31 and, moreover, was the third highest on record since data were first compiled in 1940. Regionally, occupancy of 80 percent or better was reported in each of the following areas: East North Central; West North Cenral; South Atlantic; East South Central; and Mountain.

Seasonal net withdrawals of fresh fruits, dried eggs, and meat from cooler storage during May more than countered the net into-storage movement of other cooler products so that by the end of the month total weight, reduced by approximately 35 million pounds, was down to 1.2 billion pounds. When compared with previous May 31 cooler stores, last month's supplies were about 14 percent less than in 1951 and 10 percent less than average. On the other hand, commodities reflected slight seasonal gains and by May 31 totaled 2.2 billion pounds. These stores were almost 50 percent greater than average and more than a fourth above the 1951 stocks as net increases in holdings of frozen fruits, dairy, frozen eggs, and selected meat products outweighed seasonal withdrawals of meats, poultry, and frozen vegetables.



Occupancy of Refrigerated Warehouses 1945-1952

Apples remaining in storage on May 31 totaled a little more than a million bushels while last year there were almost 3 million. Seasonal withdrawals also reduced holdings of potatoes, onions, celery, other fresh vegetables, peanuts in shell, and other nuts in shell. May 31 stocks were greater than the previous month for dried and evaporated fruits, canned fruits and vegetables, peanut meats, and other nutmeats.

Frozen fruit stocks increased by greater than average amounts during May and by the end of the month totaled 200 million pounds which were less than average and those last year by 17 and 16 million pounds, respectively. Except for strawberries, all fruit items reflected net seasonal decreases, the largest being reported in cherry holdings which fell off 6 million pounds. Frozen strawberries amounted to 70 million pounds as net increases amounting to 29 million

TABLE 1—COLD STORAGE HOLDINGS IN PUBLIC, PRIVATE AND SEMI-PRIVATE WAREHOUSES, APPLE HOUSES AND MEAT PACKING PLANTS (000 LBS.)

	May 31, 1952	Apr. 30, 1952	May 31, 1951	Five-year Average
Meat and meat products, lbs.	1,083,901	1,230,705	839,262	724,807
Lard and rendered pork fat, lbs.	52,666	50,299	49,987	60,455
Frozen poultry, lbs.	184,238	194,965	125,359	129,076
Creamery butter, lbs.	30,500	10,522	42,590	53,319
American cheese, lbs.	163,460	139,705	169,553	137,165
Other cheese, lbs.	16,270	14,401	21,442	19,500
Shell eggs, cases	3,158	2,184	2,083	3,159
Frozen eggs, lbs.	145,489	111,185	162,659	186,914
Apples, bu.	1,026	2,894	2,844	1,765
Frozen fruits, lbs.	200,428	191,794	216,103	217,387
Frozen vegetables, lbs.	300,402	313,708	270,206	213,881
Frozen fish, lbs.	123,728	113,544	105,944	92,101

TABLE 2—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net Piling Space (000 cu. ft.)		May 31, 1952 (%)		Apr. 30, 1952 (%)		May 31, 1951 (%)		5-Year Average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	3,049	6,233	37	75	39	76	50	68	47	65
Middle Atlantic	32,685	33,455	56	76	55	74	59	71	53	65
East North Central	26,851	24,972	67	83	63	83	72	77	67	69
West North Central	7,941	15,247	71	88	65	90	68	84	71	78
South Atlantic	8,171	9,801	62	80	64	82	66	78	69	77
East South Central	2,512	3,444	63	94	62	84	72	89	79	86
West South Central	7,253	7,508	67	67	65	61	63	62	65	64
Mountain	1,475	2,526	76	85	73	88	71	63	73	70
Pacific	12,951	21,747	57	63	54	62	46	54	45	57
United States	102,888	124,933	61	77	59	76	62	71	60	68

TABLE 3—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS (APPLE HOUSES EXCLUDED)

	Private and Semi-Private Warehouses						Meat Packing Establishments					
	Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent May 31, 1952		Apr. 30, 1952		Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent May 31, 1952		Apr. 30, 1952	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England					43	50						
Middle Atlantic	1,707	1,280	30	56	32	56	1,774	172	63	78	62	79
East North Central	3,104	5,116	72	63	61	74	4,729	1,272	86	88	80	95
West North Central	497	2,279	75	69	58	63	8,804	4,643	87	91	89	95
South Atlantic	412	1,575	12	61	42	72	694	172	81	100	87	100
East South Central							67	64	100	85	99	89
West South Central	187	268	89	92	56	93	294	160	100	100	100	100
Mountain					94	81	111	94	86	100	92	100
Pacific	3,121	2,586	18	36	19	34	2,444	363	88	91	88	93
United States	9,028	13,104	43	59	43	62	18,917	6,940	85	91	84	94

NOTE:—Blank spaces indicate that insufficient returns were received.

pounds were reported during May; these stocks were only 7 million pounds less than the all-time May 31 high recorded last year. Frozen orange concentrate stores continued to increase during May and reached a total of 27 million gallons by the end of the month as compared with 23 million the previous month.

Greater than average withdrawals of frozen vegetables reduced national stores to 300 million pounds as all vegetable items except asparagus and spinach reflected seasonal declines. Lima and snap beans led in total amounts moved from storage with reductions of 6 million pounds each. Asparagus stocks increased 4 million pounds to 11 million; spinach holdings were at record high for May 31 with more than 44 million pounds reported on hand. Carryoevr stocks of green peas—64 million pounds—were the largest ever reported on May 31.

The net into-storage movement of butter was about twice the amount moving into storage last year and by the end of May total holdings increased 20 million pounds to bring the national total to approximately 30 million pounds. This compares with 43 million in store last year and average May 31 stocks of 53 million pounds.

Cheese supplies while greater than average for May 31 with 184 million pounds reported in storage, nevertheless were 13 million pounds below stocks last year.

Net accumulations of shell eggs brought total holdings up to a little more than 3 million cases but of this amount about 280,000 cases were government owned. Holdings in the East North Central States accounted for more than a third of the national while Middle Atlantic and Pacific Coast storages each held less than a fifth of the total.

National holdings of poultry were reduced by 11 million pounds leaving 184 million on hand May 31. This net withdrawal was only about half the net disappearance last year and the average May net decrease. Turkey stocks were down to 63 million pounds thereby reflecting seasonal decreases of 9 million pounds while last year the net change was 12 million pounds.

Withdrawals of beef from storage during May was twice the average amount withdrawn during the 5-year period ended 1951 and three times greater than net disappearance last year; however, holdings were still at near record level for May 31 with 203 million pounds reported in storage. Holdings of pork were also being reduced by greater than average amount. Net withdrawals during May totaled 99 million pounds which was the largest ever reported for this time of year. Although total holdings were down to 725 million pounds, they were still more than two-fifths greater than average and almost a fifth greater than last year. Lard and rendered pork fat reflected seasonal gains of 18 million pounds as national holdings in refrigerated storages totaled 107 million pounds.

An increase in fishery products holdings of about 12 million pounds brought May 31 stocks to 143 million on hand last year and 155 million pounds. This compares with 131 million on hand last year and 115 million in store May 31 during the 5-year period ended May 31. Frozen fishery products amounted to approximately 124 million pounds as a result of heavy seasonal gain in stocks of frozen halibut.

Storage Outlook

By the end of June, cooler occupancy should be about equal to the average reported during the 5-year period ended 1951 but less than the June 30 occupancy last yera. An increase up to 4 points is not unlikely even though a gain of this amount has been reported only once since 1947. With freezer occupancy beginning to increase during May the upward cycle started a month earlier than expected with the highest occupancy ever reported at the start of a new season. Although meats and poultry will be moving from freezer storage during June, net into-store movements of other freezer commodities will bring occupancy up to 80 percent or better by the end of the month.

Canadian Holdings of Fruits and Vegetables

The Dominion Bureau of Statistics, Agricultural Branch, reports the following commodities held in cold storage on May 1, 1952.

Apples in cold and common storage on May 1, 1952 amounted to 267,000 bushels as compared with 683,000 bushels April 1, 1952 and 857,000 bushels May 1, 1951.

Frozen Fruit holdings in storages and factories May 1, 1952 amounted to 14,388,000 lbs as compared with 16,517,000 lbs April 1, 1952 and 11,077,000 lbs May 1, 1951.

Stocks of frozen vegetables in storages and factories on May 1, 1952 amounted to 7,136,000 lbs as compared with 8,473,000 lbs April 1, 1952 and 8,195,000 lbs. May 1, 1951.

New Cold Storage For Beverage Bottling

COSTING a quarter-million dollars, an elaborate and attractive new cold storage setup is to be constructed, with facilities for harboring the Coca-Cola bottling works, by the Anchorage Cold Storage Co. in Anchorage, Alaska. The bottling works will occupy a share of the space in the new freezing edifice, whose plans were announced by Milton W. Odom, president.

That portion of the plant to be reserved for the bottling business will have an eighteen foot ceiling for facilities and equipment while the rest for cold warehousing will have a fifteen foot ceiling in cold rooms and cold storage quarters of diversified temperatures.

Practical Refrigerating Engineer

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS

Bert C. McKenna, Chicago, Ill.
Director, National Association Practical Refrigerating Engineers

NEWS

OPERATING

MAINTENANCE

QUESTIONS -- ANSWERS

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A. R. CARLSON, *Chicago, Ill.*

First Vice-president
ALVIS CLAY, *Memphis, Tenn.*

Second Vice-president
LEO VIVIEN, *New Orleans, La.*

Treasurer
LELAND KENAGY, *Newton, Kans.*

Sergeant-at-Arms
H. B. BRANHAM, *Pocatello, Idaho*

EXECUTIVE OFFICE
435 North Waller Avenue
Chicago 44 • Illinois

Methods Employed to Accommodate Reduced Loads in Air Conditioning Plant

H. G. VENEMANN,
Professor of Refrigeration, Purdue University
Chairman Educational Committee, N.A.P.R.E.

AIR conditioning plants are usually designed for maximum or near maximum load conditions. The outdoor wet and dry bulb temperatures are selected from a table of *Outside Design conditions* for the locality under consideration, and the indoor temperatures are selected to fall within a so-called *Comfort Zone*, or more particularly to satisfy a certain *Effective Temperature*.

Using these as the limiting conditions of temperatures the designing engineer computes (1) the *Space Sensible* and *Latent Heat Loads* and (2) the *Apparatus Sensible and Latent Heat Loads*. The *Space Sensible Heat Load* is used to determine the quantity of air to be circulated. The *Apparatus Sensible* and *Latent Heat Loads* are used to determine the capacity or displacement of the compressor and highside, as well as the capacity of the evaporator coils. The compressor capacity is always the sum of the Apparatus Sensible and Latent Heat Loads, either of which may change considerably. In muggy weather the sensible heat load may remain constant or change very little, while the latent heat load may increase.

Compressor Reduction

Compressor capacity reduction is accomplished by any of the following methods:

(a) Reduced speed, (b) Reduced suction pressure, (c) Reduced operating time, (d Cutting out one or more cylinders, (e) Increasing cylinder clearance, (f) By-passing discharge gas into low side.

Evaporator Reduction

The evaporator capacity becomes a matter of coil design and involves any or all of the following factors:

(a) Coil surface (prime and secondary).

(b) Spacing and dimensions of fins.

(c) Face area of coils.

(d) Number of rows deep.

(e) Distribution of refrigerant through coils.

(f) Evaporating temperature of refrigerant.

(g) Air velocity through coils.

(h) Initial and final air temperatures, wet bulb and dry bulb.

(i) Air quantity. This may be altered by fan speed or by by-passing.

H. G. Venemann

Example of Apparatus Load Reduction

Apparatus has been selected for a 100 ton load and is to accommodate a reduced load of only 60 tons. The 100 ton load consists of cooling 1460 pounds of fresh air per minute from 100 degrees dry bulb and 76 degrees west bulb to 65 degrees dry bulb and 58.9 degrees wet bulb. None of the air is recirculated. This load is made up as follows:

Internal sensible heat	35.91 tons
Internal latent heat	9.35 tons
External sensible heat	27.01 tons
External latent heat	27.73 tons
Total	100.00 tons

A detailed analysis of this is shown in Figs. 1 and 2.

Fig. 1 shows conditions on a psychrometric chart.

Fig. 2 shows conditions on a flow diagram, and sets up a heat balance of the system.

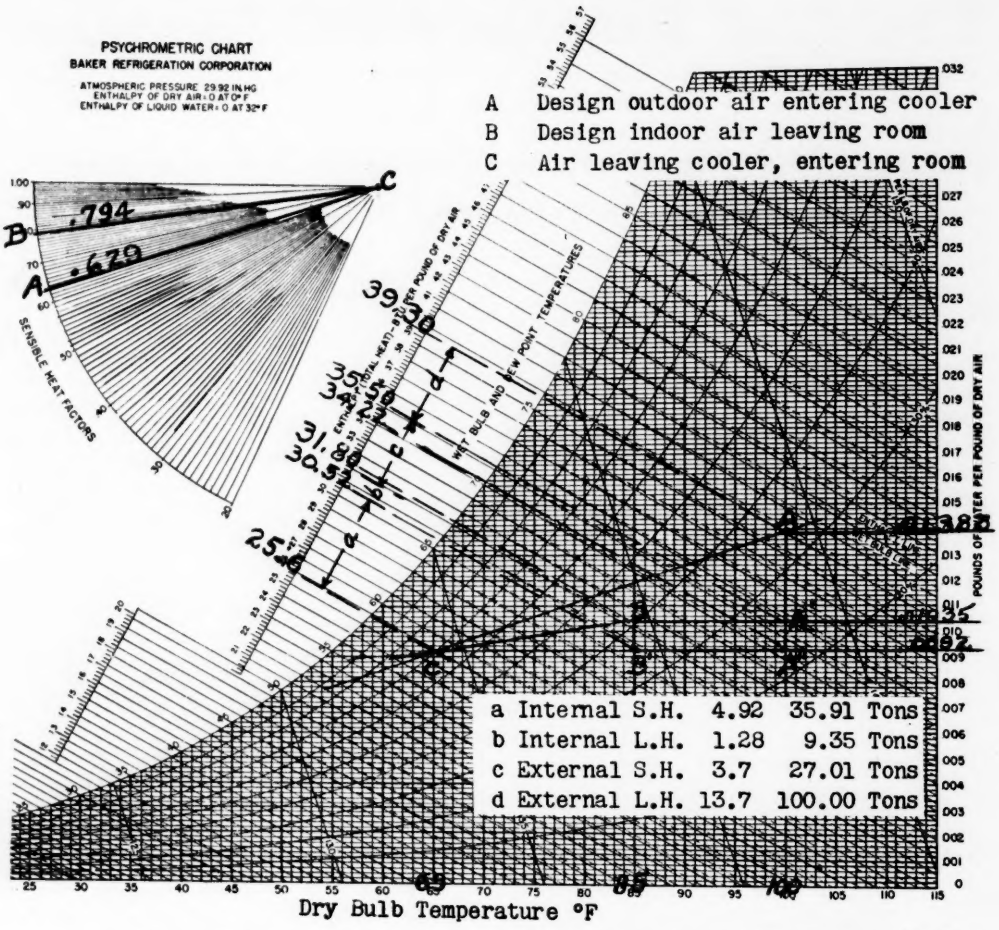
PSYCHROMETRIC CHART
BAKER REFRIGERATION CORPORATION
ATMOSPHERIC PRESSURE 29.92 IN. HG
ENTHALPY OF DRY AIR = 0 AT 0° F
ENTHALPY OF LIQUID WATER = 0 AT 32° F
A Design outdoor air entering cooler
B Design indoor air leaving room
C Air leaving cooler, entering room
.794
.629
SENSIBLE HEAT FACTORS
WET BULB AND DEW POINT TEMPERATURES
POUNDS OF WATER PER POUND OF DRY AIR
a Internal S.H. 4.92 35.91 Tons
b Internal L.H. 1.28 9.35 Tons
c External S.H. 3.7 27.01 Tons
d External L.H. 13.7 100.00 Tons
Dry Bulb Temperature °F

Fig. 1—Psychrometric chart showing data for maximum 100 ton load.

Reduced Load Conditions:

Under reduced load conditions we are assuming the following:

Outside air, dry bulb temp. 80, — wet bulb, 71.5.

Inside air, dry bulb temp. 75, rh 50 percent.

Leaving cooler, dry bulb temp. 55, rh 85 percent.

This load is made up as follows:

Internal sensible heat	21.24 tons
Internal latent heat	7.00 tons
External sensible heat	5.04 tons
External latent heat	26.72 tons
Total	60.00 tons

It is quite obvious that to accommodate this total load of 60 tons, one of the methods suggested above may be used to reduce the compressor capacity. However good judgment must be exercised on the part of the operating engineer to accomplish a satisfactory reduction in evaporator capacity. By the use of dampers A, M and N in Fig. 2, most any control may be obtained. And as a last resort if the air leaves the coil too cold, the reheat coils may be put to use.

In the May 1951 issue of Refrigerating Engineering, D. D. Wile discusses this subject as applied to small automatically controlled air conditioners very clearly and with excellent illustrations.

Propose Water Control for Air Conditioning Units

A REQUEST for the establishment of rules requiring owners of air conditioning and refrigerating units to reuse their water or pay a special rate over their normal water requirements was submitted to the Arkansas Public Service Commission (May 20) by the General Waterworks Corporation of Pine Bluff, which operates water works systems in 11 Arkansas communities.

Although taking the application under advisement, the commission indicated that the corporation should meet the problem by establishing rules of its own and filing a schedule of rates to supplement the rules. The company's application would affect users of all air conditioning units of five-ton or more capacity.

J. Richard Pierce, vice president of the firm, said that if the increase in water use for air conditioning and refrigeration purposes continued as it had in recent years, within five years his company would be supplying as much water as it did for all purposes last August.

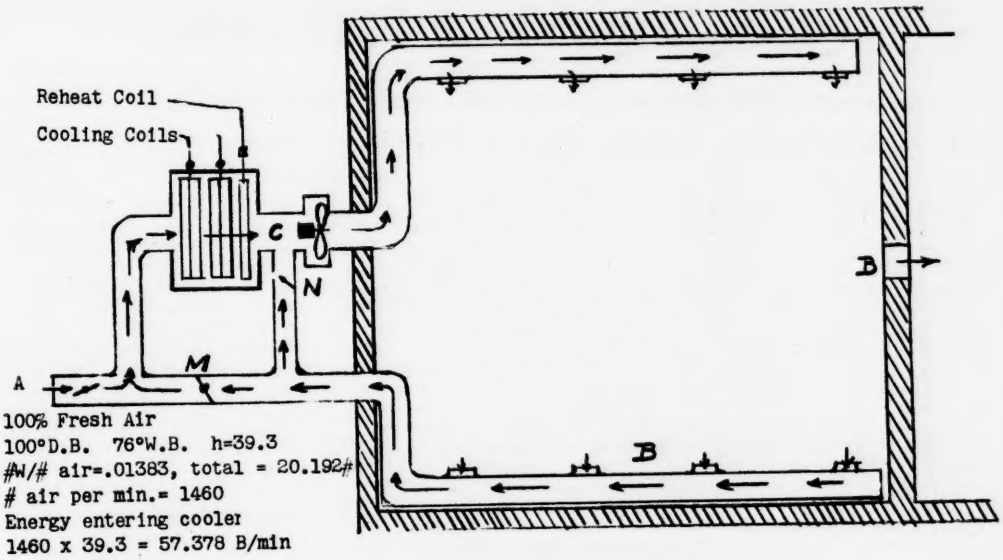

Fig. 2—Sketch showing arrangement of dampers for modifying airflow.

Finishes for Low Temperature Insulation

THE theory and application of finishes for low temperature insulation was discussed by Merrill F. Kottmeier of the Building Material Division of the Armstrong Cork Co. at the January meeting of the Chicago Section of the American Society of Refrigerating Engineers.

A low temperature finish, he said, must protect the insulation from infiltration of moisture vapor which usually travels from the warm side to the cold side where it will condense when it reaches its dew point. Insulation efficiency is thus lost depending upon the degree of moisture vapor transmitted. In low temperature jobs, ice is formed within the insulation, which will produce insulation failure.

Work on the effectiveness of barrier finishes was not undertaken until the Penn. State-Armstrong water vapor transmission cell was developed where by reproducible test results are obtainable to plus or minus one-tenth perm. This moisture vapor transmission unit of measurement adapted at the suggestion of the Penn. State group and identified as a "Perm" is one grain, per square foot, per hour, per inch of mercury. A maximum of one Perm has been prescribed in order for a material to be considered as a vapor barrier by the building industry.

Although their evaluation of finishes is far from complete, the results show that an asphaltic clay emulsion with selected asbestos fibres will give a suitable moisture vapor resistant finish. Washed, clean white sand may also be added as a filler to minimize drying shrinkage and to import good troweling characteristics and abrasion resistance. Aluminum cold storage paint also works well. Weather proof plastic produced from a Gilsonite base and blended with other asphaltic materials with oxidizing properties and filled with long fibered asbestos exhibits excellent outside weathering characteristics. Water proofing is accomplished after the first troweling is applied by pressing a membrane into the surface or spirally wrapping with insulation tape.

Yearly maintenance is a must and is just as necessary on low temperature insulation finishes as periodic boiler blow-downs to keep a power plant in operation. A new surface coating should be applied of No. 1 or No. 4 asphalt point every three to five years on inside jobs, depending upon atmospheric conditions. Outside maintenance should be applied every one to three years.

There is also a field in special finishes such as, where a fire resistant vapor barrier coating is required. Other finishes require resistance to oils, greases and solvents. In these cases a solvent resistant finish "Solvopruf" which is also used as an adhesive will resist the deteriorating effects of methyl ethyl ketone, gasoline, aromatic solvents, aliphatic solvents, greases, oil, alcohols and water. It is also a vapor barrier from minus 35 to plus 125 F.

Cooling Load Estimate

Recommended practice for members of the Self-Contained Air Conditioner Section of The Air Conditioning and Refrigerating Machinery Association, Inc.

THE N.A.P.R.E. is indebted to William B. Henderson, executive vice-president of the Air Conditioning and Refrigerating Machinery Association, and to Mark E. Mooney, vice president of the Baker Refrigeration Corp. for permission to reproduce the cooling load estimate form, together with its instructions. We wish to publicly thank them for this cooperation.

This estimate for cooling load is recommended for self contained air conditioners through the five-ton sizes.

Instructions

A. At the bottom of this page are spaces for inserting the Summer Outside Design temperatures. These may be obtained for the principal cities of the United States by referring to the "Application Engineering Standards for Air Conditioning for Comfort," published by Air Conditioning & Refrigerating Machinery Association, Inc.

B. Insert the information called for in the six Job Identification lines at the top of the Estimate Form.

C. The following numbered paragraphs refer to the item numbers of the Estimate Form.

Persons in Space

1. Insert the number of persons to normally occupy the space after the air conditioning is installed. If all the people are engaged in the same activity, the number should be placed on the proper line. If some are more actively engaged than others, the total number would be properly divided on the two lines. If it is a space which would be occupied by a large number of people for only a few minutes' duration and then a smaller number for the remaining time, use the largest number which would be present for approximately 15 minutes' duration.

2. Insert the maximum total square feet of window area on any one wall of the space exposed to direct sunshine. Refer to table A and select the proper factor which must be inserted in space indicated. If all of the windows are on the North wall or on a wall shaded completely from the sun by an adjacent building, no figure will appear in this item.

3. Insert the total number of watts in use, not including the watts consumed by appliances listed in table B. Lights in store show cases contribute heavily to the load and must not be neglected.

Other Heat Sources

4. Use table B for calculating the heat load due to gas and electrical appliances and motor-driven apparatus. Insert the total in the space indicated in item 4.

5. After checking the extensions of the first 4 items, add them and carry this sub-total to space at right.

6. Insert the total square feet of windows not included in item 2. In table C select the factor for these windows under the design outside dry bulb temperature previously established. Insert this factor in space indicated in item 6.

7. Three lines are provided in this item as it is quite possible that several wall constructions may be used on a particular space. In each case subtract the area of the windows from the total wall or partition area and insert the total net wall or partition areas. In table C select the proper wall or partition factor shown under the design temperature already established. Insert these factors on the proper lines at the spaces indicated in item 7.

8. Insert the total square feet of floor area. Refer to table C for the factor to be inserted in the space indicated.

Outside Temperatures

9. Insert the total square feet of ceiling area. Refer to table C for the factor which fits the conditions of the building. Adjust this factor if ceiling is insulated and insert the factor or adjusted factor in space indicated.

10. Use table D for calculating the ventilation or infiltration cfm. The total number of occupants must equal those used in item 1. The infiltration does not include the cfm which would enter space if doors or windows are permitted to remain open. Insert the cfm in space provided. Refer to table E and select the factor shown under the design outside wet bulb temperature previously established. Insert this factor in space indicated.

11. After checking the extensions of items 6 through 10, add them and carry this sub-total to space at right.

12. Add sub-totals, items 5 and 11. This total is the Btu per hour cooling load. An Air Conditioner with capacity equal to or greater than this load must be selected to obtain comfort conditions within the space.

LOCAL SUMMER OUTSIDE DESIGN TEMPERATURES

FOR CITY OF.....	DRY BULB..... °F.	WET BULB..... °F.

For table C use factors under temperature encircled.	Outside Dry Bulb °F	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104
For table E use factors under temperature encircled.	Outside Wet Bulb °F	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80		

COOLING LOAD ESTIMATE

Recommended Practice for Members of Self-Contained Air Conditioner Section of

This estimate is suitable for comfort air conditioning jobs not requiring specific conditions of temperature and humidity.

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AIR CONDITIONING AND REFRIGERATING MACHINERY ASSOCIATION, INC.

Customer ..... **Buyer** .....

Address ..... **Space to be used for** .....

Estimate by ..... **Date** ..... **Approval** ..... **Date** .....

1. **People** ..... (Number Sitting or Moving Slowly) ..... × 400 = ...
   ..... (Number Working, Dancing or Similar Activity) ..... × 680 = ...
2. **Windows Exposed to Sun** ..... (Total Sq. Ft.) ..... × ..... A = ...
   (Figure this item for the one sun exposure having largest window area)
3. **Lights and Electrical Appliances** ..... (Total Watts in Use) ..... × 3.4 = ...
   (Include in this item only those appliances not listed in Table B)
4. **Other Heat Sources** ..... B = _____
5. **Sub-total—Sum of Items 1 thru 4** ..... = ——→ .....
6. **Windows Not Included in Item 2** ..... (Total Sq. Ft.) ..... × ..... C = ...
7. **Walls and Partitions** ..... Sq. Ft.—Windows ..... Sq. Ft. = ... × ..... C = ...
   ..... Sq. Ft.—Windows ..... Sq. Ft. = ... × ..... C = ...
   ..... Sq. Ft.—Windows ..... Sq. Ft. = ... × ..... C = ...
8. **Floor** ..... (Total Sq. Ft.) ..... × ..... C = ...
9. **Ceiling** ..... (Total Sq. Ft.) ..... × ..... C = ...
10. **Ventilation or Infiltration** ..... (Cu. Ft. per Min.) ..... D × ..... E = _____
11. **Sub-total—Sum of Items 6 thru 10** ..... = ——→ _____
12. **Total Btu. per hour Cooling Load to be used for Selection of Unit—Sum of Items 5 and 11** ..... = ...

COOLING LOAD FACTORS

WINDOWS EXPOSED TO SUN—SOLAR RADIATION FACTORS FOR DIFFERENT ORIENTATIONS TO BE INSERTED AT A

Direction Windows Face	NE	E	SE	S	SW	W	NW
Clear Glass (Single or Double) No Protection	110	180	160	105	160	180	110
Shaded Completely by Awnings	36	50	45	30	45	50	30
Light Colored Inside Shades or Venetian Blinds	65	110	95	60	95	110	65
Glass Brick No Protection	44	72	64	42	64	72	44

A

OTHER HEAT SOURCES TO BE INSERTED AT B

Beauty Parlors	Number of Operators	× 2000 =
Electric Motors	Total Name Plate HP	× 2800 =
†Gas Burners	Number	× 6000 =
†Glass Coffee Makers	Number	× 900 =
†Coffee Urns—Gas or Electric	Cup Capacity in Gallons	× 1400 =
†Steam Tables—Electric	Sq. Ft. Area of Top	× 550 =
†Steam Tables—Gas	Sq. Ft. Area of Top	× 1300 =
Additional Heat Sources		BTU/Hr. = _____

†Factors for appliances equipped with hood and positive exhaust should be reduced by 50%. Insert Total At B .....

B

WINDOWS, WALLS, FLOORS AND CEILING TRANSMISSION FACTORS FOR VARIOUS OUTSIDE DESIGN TEMPERATURES—INSERT AT C

Outside Dry Bulb °F	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104
Windows (No Sun)	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Walls—Heavy Masonry	3	3	3	3	4	4	4	4	4	5	5	5	5	6	6	6	6	6	7
Walls—Average Masonry	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	7	7	7	7
Walls—Insulated Masonry or Frame	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	4	4	5
Walls—Average Frame	2	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7
Partition—Inside, Single Thickness	5	5	6	7	7	8	8	8	9	10	10	11	11	12	12	13	14	14	15
Partition—Inside, Double Thickness	3	3	3	4	4	4	4	5	5	6	6	6	6	6	7	7	7	8	8
Partition—Display Window Back	11	12	13	13	14	14	15	15	16	17	17	17	18	19	19	19	20	21	21
Glass Brick (No Sun Exposure)	4	4	5	5	5	6	6	7	7	8	8	8	9	9	10	10	10	11	11
Floor	2	2	2	2	3	3	3	3	3	4	4	4	4	5	5	5	5	5	6
Ceiling Under Unventilated Attic*	11	11	11	12	12	12	12	13	13	13	13	14	14	14	15	15	15	15	16
Ceiling Under Ventilated Attic*	7	7	8	8	9	9	10	10	10	11	11	12	12	13	13	14	14	14	15
Ceiling Under Flat Roof*	12	12	14	14	14	15	15	15	16	16	16	17	17	17	18	18	18	19	19
Ceiling Under Occupied Floor*	2	3	3	3	3	3	4	4	4	5	5	5	6	6	6	6	6	7	7

C

*Adjust factor selected from this table if Ceiling is insulated. Example: 4" Insulation—0.8 × Selected Factor = Adjusted Factor.

1" Insulation—0.4 × ..... = ... 2" Insulation—0.6 × ..... = ... 4" Insulation—0.8 × ..... = ...

VENTILATION OR INFILTRATION QUANTITY TO BE INSERTED AT D

Calculate Requirements for Both Ventilation and Infiltration, and Use Larger Quantity Cu. Ft. per Minute (CFM). Use No Less CFM than Required by Local Ordinance, and no less than amount drawn from space by exhaust fans if used.

VENTILATION REQUIREMENTS

SMOKING	No. OCCUPANTS		C.F.M.
None	.....	× 7½ =	.....
Light	.....	× 15 =	.....
Heavy	.....	× 40 =	.....

D

INFILTRATION

(H)=Room Height (L)=Length (W)=Width (G)=Wall Factor

Room with one outside wall (G) = 1

Two outside walls (G) = 1.5

Three or more outside walls (G) = 2

$$C.F.M. = \frac{(H) \times (L) \times (W) \times (G)}{60} = \text{.....}$$

VENTILATION OR INFILTRATION FACTOR FOR VARIOUS OUTSIDE DESIGN TEMPERATURES IN °F.W.B. TO BE INSERTED AT E

Outside Wet Bulb °F	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Factor	0	1	3	5	8	11	14	17	20	23	27	30	33	37	41	45	49

E

N A P R E

Question Box

H. G. Venemann, Professor of Refrigeration, Purdue University and chairman of NAPRE Educational Committee, answers members operating problems monthly in this column. Send questions to Chairman H. G. Venemann c/o Purdue University, West Lafayette, Indiana.

Mixed Brine Reading

ANOTHER ANSWER TO QUESTION 917 (See May issue) On this occasion of writing I would inject my thoughts on question 917 concerning the freezing of mixed brine. I was curious to read what the responses to this query would be, for it often involves a "mystery" to the operating personnel of our plants. Your reply in the May issue confirmed the usual results.

I have on numerous occasions in my practice changed over brine from calcium to sodium. In fact it is now being done in several plants.

Ca and Na brines can be mixed if some care is exercised, namely, to insure during the mixing period that the evaporator temp. is permitted to rise, in order to prevent the Na salt, usually dumped in and not properly mixed, from being frozen out immediately. It is best mixed by pumping brine through the salt in an external container. It appears that your correspondent dumped in salt with coils at 0.4 F. The immediate heavy saturation was beyond the eutectic point and a slush formed as well as salt freezing out. Normally given time this will redissolve if too much salt was not added, which is the usual situation.

Your correspondent apparently kept adding salt until too much was added and it was freezing out with slush. The 19 F brine indicates that slush had formed on the coils.

From a practical viewpoint I have always recommended when mixtures are involved to allow the suction temp. to rise above 30 psi during mixing and to add salt *beyond* the cooling surface. By this I mean, to add salt after the agitated brine leaves the cooler or "trunk" and when possible, it is an efficacious rule. In a coil tank a high suction and slow addition of a salt mixture is advisable.

Had your correspondent realized his dilemma he could have corrected matters by allowing his back pressure to rise, kept his agitator in operation and kept on adding water to his system allowing the excess to overflow, a loss, of course, but not so great as making up new brine.

When a change from salt brine to calcium brine is made there is no way of preventing the salt from freezing out because densities of $CaCl_2$ brine are usually such as to be beyond the eutectic point and saturation point for salt. Salt will drop out as salt on the evaporator surfaces and very gradually be washed away dropping out in parts of the system when turbulence does not exist to any extent.

ROBERT T. BRIZZOLARA
New York, N. Y.

Venemann Comments on Answers to Question 917

I want to comment on the interest taken in question 917 regarding the mixing of common salt with calcium chloride brine. The question was first submitted by Ralph B. Wylde of Trichinopoly, South India. I answered the question directly by letter before it appeared in the April issue of ICE AND REFRIGERATION suggesting that he keep adding salt until the ice disappeared from the brine coils. Mr. Wylde answered my letter and informed me that he had already tried my remedy "only to make matters from bad to worse." He solved his problem by getting rid of all the old brine and using a fresh charge of common salt.

I admitted that I was wrong in the May issue and subsequently (June issue) published the recommendations of Mr. Bennett, Dow Chemical Co., who substantiated Wylde's method of changing over to all salt.

I now find that it is not necessary to throw out the old brine, but that, if done in the proper manner, salt may be added with entirely satisfactory results. I erred in not telling how it should be done.

In this (July) issue Robert T. Brizzolara, an eminent consulting engineer from New York, explains very clearly the method he uses for adding salt to calcium chloride brines. I wish to add that Mr. V. Miniowicz of Haifa, Israel has written a lengthy answer to this same question. He, like Mr. Brizzolara, has been successful in adding common salt to calcium chloride brines, and explains his method of doing it. He furthermore has prepared a table based upon data published by Mr. Eugen Wilbusewich of Haifa, by which one may know how much of the old brine to remove and the weight of salt to add in order to obtain a definite specific gravity mix. I wish to acknowledge Mr. Miniowicz's contribution to this question even though it arrived too late to publish in its entirety.

I want our American brothers to realize that ICE AND REFRIGERATION gets around, and that it does my heart good to learn how much interest is taken in the Question Box by our brothers in distant lands.—H.G.V.

Controlling Humidity

ANSWER NO. 2 TO QUESTION *921* (See June Issue) Regarding the R. H. on shell eggs, advise that for the past four or five years we have been receiving about 10 percent or less of shell eggs for storage compared to previous years. The matter of maintaining a relative high humidity was difficult at times, especially when the eggs first came into storage, as much of the humidity was first absorbed by the cases, fillers and mapes. When we started to fill egg rooms we usually wet the floors pretty well and we also used our humidifying machines, or foggers as we call them, which throw out a fine mist or fog depending on how thick a fog we wanted.

Several warehousemen at the convention asked me about our humidifying units and I have written them as follows:

We purchased two units about fifteen years ago from the Wm. J. Lohman, Inc., 62 Ninth Ave., New York, N. Y. their type PHl Nos. 1472 and No. 1555. This company later moved to Irvington, N. J. and is now known as the Chelsea Products, Inc., 639 South Ave., Plainfield, N. J. of which Mr. Wm. J. Lohman is the head. I do not know if they still make these units, but I suggest you write the Chelsea Products who should be able to give you the necessary information.

These units are portable, with a tank of about 30 gallon capacity mounted on a platform and rubber wheels, 1 phase, 60 cycle, 110 volt current. It is equipped with a small centrifugal water pump, a small electric heating element in the bottom of the tank to prevent water from freezing if necessary, and also a spray fan on top with a funnel arrangement which puts out the water spray. The spray can be adjusted to any desired density and also has a tray below the spray for drain back into the tank in case the spray is too heavy. We call it a fogger and it is very effective.

I endeavored to look up the invoice for these units but our records do not go back that far so I am unable to tell you what we paid for them.

We usually put 12 to 14,000 cases in

a room and endeavored to hold the humidity at 90 or better, with a temperature of 30 degrees. We also have piped ozone into the egg room and carried about .5 to 1.5 MGs. Today we do not receive enough shell eggs to fill a half room.

When we used to receive a lot of shell eggs, they were not shell treated as they are now, this is all the more reason that we had to run a high humidity to prevent shrinkage in storage. Personally I think with shell eggs now being treated that 85 or slightly more would be sufficient. Years ago we used to strip each layer and leave space between each row also off the floor 2 to 3 inches, later years we only kept them off the floor, quit using stripping and piled solid, so most of your shrinkage would take place on the outside cases only. I don't suppose many houses strip egg cases any more for that reason, and also due to added labor costs.

Usually with a high humidity the eggs in storage after August would begin to show fuzz or what we call a whisker stage. At that time we would drop humidity to 86 or 88 and lower the temperature to about 29½ which would retard this condition. Today with fiber cases it affects the paper cases or fibre if you carry a high humidity, they will not stand up like the old wooden cases I think 86 to 88 would be the maximum to use on fibre cases. We have never used steam to increase humidity, personally I think it would force the temperature up considerably.

Years ago we noticed considerable eggs that were shrunken when coming into storage; this was due to the methods the eggs were gathered and handled before coming into storage. The good old days when the farmers would come in town once a week with their shrunken eggs and trade them for groceries and then the grocer would set them behind a good hot stove in the back room until some egg dealer picked them up is gone. Most egg dealers now have country routes and they drive right up to the farmers house for the eggs and if his eggs are not up to grade he so tells the farmer. They also, pick up eggs on most of their routes more often so they don't lay around and shrink.

I think I better stop talking about shrunken eggs sounds more like ancient history. Years ago eggs used to stay in cold storage 10 to 12 months, now they stay in only 2 to 4 months, so it is not too profitable a commodity for a warehouse to handle, you don't get the storage carry. Furthermore you can't store any other commodity with eggs on account of the high humidity necessary and also the 30 degree temperature necessary. Most commodities will not store at this temperature. GOOD-BYE EGGS.

L. M. ASHENBRENNER
Great Lakes Terminal Warehouse Co., Toledo, Ohio

Leak in Condenser

Question No. 922: A few days ago, a double tube ammonia condenser at a local packing house developed a leak, with the result that ammonia vapor or liquid was introduced into the city water mains for about a block on either side of the plant. The water supply in that area was contaminated to such an extent that it had a very strong ammonia odor and turned a very dark color.

City officials of water and health departments are very much concerned, and are trying to develop some means of preventing a recurrence of this cross connection. They had representatives at our last monthly meeting and the problem was discussed at some length.

As a temporary measure they have recommended a check valve be installed in feed water lines to all condensers other than the evaporative type. This in my opinion would not be effective to any great extent. A supply tank, vented to atmosphere, and feeding water to condenser by means of a pump, with proper controls and water failure cut-out was also suggested.

Water pressure in city mains varies from about 18 psig to 95 psig, and there are plants in locations supplied by these and intermediate pressures. We would appreciate it very much if you could help us answer the following questions:

(1) Has this type of accident ever happened elsewhere, and if so, what was done to remedy the situation?

(2) Do you know of any device that would prevent this absorption of refrigerant, other than the evaporative condenser?

(3) What are the effects on water if this condition developed with Freon 12, methyl chloride or carbon dioxide?

We are of the opinion that no system is entirely foolproof as long as refrigerant and water are contained in the same vessel such as a shell and tube condenser, and connected directly to the main. However, any suggestion or information you may have to offer may be of great value to us in satisfying the authorities that these machines are made as safe as possible. —R.P.M.

ANSWER: Since this question was submitted we have received further information concerning the layout.

"The plant consists of two ammonia compressors, one of which has been in operation for some time. The other is automatically controlled. Both

compressors discharge into a common double pipe condenser twelve pipes high.

"Water is supplied from a 2 inch city main through a ¾ inch pipe into the bottom of the condenser, thence through the condenser and compressor water jackets (in parallel) and into an open sewer. A pressure-controlled automatic water valve is located at the inlet to the condensor. A ¾ inch by pass valve open one half turn during the winter months prevents the water from freezing. There are no valves in the water lines between the inlet to the condensor and the server.

"When the machine starts, the head pressure is at about 75 psig. This gradually builds up to 128 psig, at which point the water regulator opens giving a full flow of water. The water pressure in the 2 inch main is practically stationary between 75 and 80 psig.

"Since the accident, the condensor has been re-fitted and I was able to locate only one old water pipe. While there appeared to be numerous small marks that could have been pin holes, there was a split about 5 inches long near one end, extending along the seam of the pipe. This, no doubt, was the leak which caused the trouble.

"It is my opinion that the break occured just before, or during the period between the start of the compressor and the opening of the water valve. With the very low water velocity through the condenser at this time, the rate of absoption of ammonia in water was greater than the rate at which the water velocity could carry it away, and hence the backward movement of ammonia to city mains."

R.P.M. wants to know why the ammonia water mixture backed up into the city main and in addition he wants answers to his questions 1, 2 and 3.

It is my opinion that the ammonia produces salts in the water jackets of the compressors which crystallize and prevent the water from flowing through, thus building up an excessive pressure in the condenser water lines.

(1) I have never heard of a similar accident occurring elsewhere, though I have seen the flow of water through condensers practically stopped because of the precipitation of salts in water into which ammonia had leaked.

(2) Careful attention on the part of the operator to ammonia leaks in the condenser and being sure that the

overflow water gets to the sewer would prevent a recurrence of the trouble.

(3) Freon 12, methyl chloride and carbon dioxide are only slightly soluble in water, and each would remain a gas if originally in gaseous form, or separate out as a liquid if in liquid form because of the difference in their respective specific weights.—H. G. V.

Changing to Full Automatic Operation

Question No. 923: I have a problem; my company talks of changing from hand operated expansion valves to full automatic.

This plant is a 250 car storage with apple packing, cold storage and shipping business. The refrigeration is direct expansion ammonia, an ice tank of 108—300 lb cans, 2,535 ft of 1¼ in. pipe submerged in salt brine, two story building about 1000 ft long, by 26 to 40 feet wide. Old style hairpin coils are in the rooms; some on the walls, some are semi-flooded ceiling coils. The flooded coils have ten pipes wide fed into the bottom headers, piped to the other end of the room and back with the pipe parallel (i.e.) bends with ten inch centers would have ten inch centers at the headers. These headers have connecting pipes to recirculate slop-over.

If I control the ceiling coil with a Sporlan thermal valve, and a dry expansion wall coil with a thermal expansion valve, with a magnetic liquid valve, on a room thermostat, ahead of the two thermal valves, and a combination magnetic back pressure suction valve behind the junction of the two coils, where do I put the thermal bulbs? Suppose the ceiling flooded coil has 666 ft of two inch pipe, and the dry wall coil has 1,552 ft of two inch pipe, would this work?

Another example: A room has two flooded ceiling coils each 1,504 ft of 2 in. pipe, the dry coil 940 ft of 1¼ in. pipe.

Another example: One flooded ceiling coil 1,624 ft of 2 in. pipe, one flooded ceiling coil 1,160 ft of 2 in. pipe, and one dry wall coil 1,154 ft. of 2 in. pipe, and one dry wall coil 892 ft of 2 in. pipe, could I combine the two dry coils on one thermal valve?

We have plenty of heat to evaporate all the liquid we can take through 33,350 ft of 2 in. pipe plus 10,360 ft. of 1¼ in. pipe, plus three 15 ton Baker units, and recondensed with 46 degree water, with pressure raised from 15 lb gage to 125 lb gage, with one 9¼ x 9¼ at 255 rpm, one 8 x 8 at 241 rpm, one 7¼ x 7¼ at 245 rpm ,and one 6 x 6 at 220 rpm, during a receiving period of one month beginning the last of August, thereafter our load and compressor needs taper off to the 6 x 6 at 30 lbs and 100 lbs the first of January.

Our present required refrigeration is 5½ tons of ice, and one ice storage 58½ ft x 35 ft x 12 ft on one dry coil, 847 ft of 2 in. pipe. The dry coils will be changed to bottom feed. We want to operate up to 2000 ft of 2 in. pipe on one thermal expansion valve to save extensive rebuilding of our dry expansion wall coils.

My N.A.P.R.E. class-instructor told me that 1,000 sq ft of pipe surface is close to the limit for maximum capacity on coils fed by thermal valves. Would the application of Sporlan valves throughout enable me to feed 2000 ft of dry coil? I have been wondering what would happen to the multiplexed coils when they are of different volumes, as all coils in one room would be in front of a back pressure valve. I have heard a number of opinions on this, so I am asking you for the real "low-down."—E.J.B.

ANSWER: Professor Venemann has sent us a copy of your letter of March 24 and has asked us to send our comments. In order to properly lay out a system of automatic controls for your plant a complete survey should be made by some qualified refrigeration engineer. Undoubtedly there are individuals or firms in your area who could come in and make such a survey and either supervise the installation or do the installation work for you. Without our having the complete piping blueprint, and without more detailed information about temperatures, pressures and other conditions, it is impossible for us to make specific recommendations.

In general, it would seem logical to use thermostatic expansion valves on the dry expansion coils, and use the Sporlan Level Master Control on the flooded coils. While thermostatic expansion valves have been used on header type coils in the past, frequently full capacity of the coil is not realized because of the fact that the refrigerant is not distributed equally to all of the circuits.

Answering one of your questions, in general the bulbs of thermostatic expansion valves should be put on the coil side ahead of any control devices in the suction line. Each bulb should be influenced by the suction gas coming from the coil that particular valve is feeding. Also, by putting the bulb ahead of any control device in the suction line the operation of the valve is not affected by any pressure drop through the suction line control.

The question of how many feet of pipe can be fed in series through one expansion valve is an old one and cannot be answered by any exact figure. The disadvantage of having too much pipe in series is a question of too much pressure drop. If a valve with an external equalizer connection is used then there is no disadvantage to a long coil as far as the expansion valve is concerned except for the fact that the valve is liable to hunt because of the time delay of the refrigerant passing through the coil. On ammonia installations coils up to 2,000 feet in length have been fed successfully under certain conditions; however better results will probably be obtained if the coils are kept to much shorter length. From our experience we have found that on 2 inch coils you can handle up to 5 tons at a suction temperature of -10 F without excessive pressure drop. You can handle up to 6 tons at 10 F suction temperature, and up to 7 tons at 25 F suction temperature. If higher loads are encountered then an external equalized valve should be used. The length of the coil enters into this discussion, of course because the refrigeration load that can be handled by a coil is measured by the area of the pipe, which is directly a factor of the length, and also by the temperature difference between the air and the refrigerant.

Our products are distributed in your area by Refrigerating & Power Specialties Company, in Portland. They have had considerable experience with our ammonia valves and can probably be helpful to you in selecting the right equipment. If you do not have a refrigeration firm that does work for you regularly perhaps Refrigerating & Power Specialties Company might refer you to some individual or company who could assist you in laying out a system of automatic controls.

H. F. SPOEHRER
Sporlan Valve Co.

ANSWER No. 2: This will acknowledge your letter of April 8, 1952, regarding the conversion of an ammonia plant to automatic operation. The information given below is based on usual field practice.

On a multiple coil system with a single evaporator pressure regulator in the main suction line, the thermo valve remote bulbs should be located on the individual suction lines from the respective coils between the coil outlet and the point where the individual suction lines tie into the main suction line. The bulbs should be applied on a horizontal run of pipe and care should be taken to avoid trapping.

The following table lists the number of linear feet of pipe per thermo valve. Individual systems have exceeded these runs successfully, but best results have been obtained with the following:

	Linear Ft. Per Thermo Valve
1¼ in. Pipe	750
1½ in. Pipe	1000
2 in. Pipe	1500

Insofar as the use of thermo valve control on an ice tank is concerned, we do not recommend it due to the unequal loading. In general, this type of system should be float controlled.

The fact that the coils, on a multi-coil system in front of one evaporator pressure regulator, are of different volumes should have no ill effect on the over-all operation.

RICHARD WILLNER
Aplication Engineer
Alco Valve Co.

Clarification of Brine

Question No. 924: We have two ice tanks, a 50 ton and a 20 ton, both treated with the usual percentage of sodium dichromate. Normally we hold a specific gravity of 1.19 and a pH of 7-8 to 8-0, with no corrosion problems, testing brine every week, taking particular care to hold the pH and density to the above figure. During the first three months of this year, I was on the mainland and when I returned the first thing I did was test the brine, and found the 50 ton tank brine had a pH of 7.4. We added one ton of calcium and raised the pH to 7.6. After the calcium was added, the specific gravity was 1.20, so we could not add more calcium to raise the pH and decided to add caustic soda (technical grade.)

The brine in both tanks was a perfectly clear amber color. We made a solution of 2 pounds of caustic to 2 gallons of water. When this solution was added, the brine became cloudy. Then I tried putting the caustic in a wire basket and suspending in the brine at the point of fastest flow, this 10 pounds congealed and would not dissolve after being left in the tank for one week. We then tried a solution of commercial grade caustic with the same results, not adding sufficient to raise the pH. We then consulted three chemists, samples were taken and tested, and it was found the only way they could clarify the brine was by changing the pH to below 7.0, but as soon as the pH was changed to the alkaline side the cloud appeared again. None had the answer to the problem of how to raise the pH without clouding the brine. The brine in the 20 ton tank had a pH of 7-4 and I tried to raise the pH by adding ammonia. The results were the same as adding caustic. We now have both tanks with cloudy brine and would like to know how to clarify this brine, also if there is anything that can be added to a clear brine to raise the pH without clouding. W.E.W.

ANSWER: Professor Venemann has asked me to comment on the problems described in your letter of April 28. I hope the following comments will help you to clear up the situation. I have never had an experience just exactly like this, but I can picture the condition, and I think I know what has happened.

In the first place, I would not have attempted to adjust the pH valve in this case. A figure of 7.4 is entirely satisfactory if the brine contains enough chromate (100 ppm or more) to control corrosion. To protect galvanized cans, it is important to keep the pH value below 8.5, perferably below 8.0, but there is no virtue in holding it up to that level artificially.

In the absence of chromate, pH values of around 8.0 to 8.5 or higher will give considerably less corrosion of bare iron surfaces than the more nearly neutral condition represented by a pH of 7.0 to 7.5. For this reason, the range of 8.0 to 8.5 was a compromise generally recommended 20 years ago before cromate treatment was generally accepted. It is a mildly alkaline condition, not strong enough to soften the zinc on galvanized cans, yet not near enough to an acid condition to result in rapid rusting. In a chromate treated brine, zinc coatings may be damaged if the pH value is too high, but the chromate, for all practical purposes, completely offsets the effect of low pH value with respect to rusting bare iron surfaces.....

I suggest that you revise your control limits as follows:

1—Maintain 100 ppm or more of chromate in the brine. This is equivalent to 6¼ lb. chromic acid or 9¼ lb. sodium dichromate per thousand cubic feet of brine. Larger amounts do not improve the condition of the brine much, but some excess is desirable as a margin of safety to offset the gradual dissipation to be expected during operation. On the other hand, a heavy excess may involve some risk of "chrome itch" among operators sensitive to skin irritations.

2—Keep the pH value below 8.5, preferably below 8.0. If treatment should drop the pH value below 7.0 it may be advisable to add a little caustic soda, but I would disregard the pH value so long as it is in the range of 7.0 to 8.0. If you want to add chromate without affecting pH value, follow up the treatment with 1 lb. commercial caustic soda per pound of chromic acid, or 5 oz. caustic per pound of sodium dichromate. Use more, or less, or none, depending on whether you want to raise or lower the pH value.

3—Keep the brine concentration only strong enough to prevent freezing on evaporator coils. Heavy brine used to be recommended to minimize corrosion, but its effect in this respect is negligible in a chromate treated brine. A heavy brine makes cans more buoyant, and you may as well avoid the problem of holding down the cans unless your operating temperature requires a heavy brine.

The turbidity precipitated by the caustic treatment in your brine is either calcium carbonate, or magnesium hydrate, or both. The water used undoubtedly contained some calcium or magnesium bicarbonate. The sharp increase in pH value at the point of caustic application resulted in the milky precipitate which will redissolve very slowly, or perhaps not at all, until the pH value is brought down again. I suggest that you add some sodium dichromate to lower the pH sufficiently to redissolve the turbidity. Then take this pH value as an acceptable level for future control. K. M. HOLADAY

NAPRE Department

New Questions

Ice Capacity Cut. Why?

Question No. 925: We have always been able to turn out 20 tons of ice daily until this summer. Now we cannot make more than 8 tons. Last winter we added a freezer room for our customers but this did not take more than three ton refrigeration capacity. We have one 8 x 8 compressor at 260 rpm and one 6 x 6 at 250 rpm. Before we added the freezer room we operated at 20 lbs suction pressure and 160 lbs discharge. Now we operate at 5 lbs suction and 150 lbs discharge, but we cannot make enough ice. Would you please explain why?—A.R.L.

Warmer Brine With Colder Ammonia! A Paradox?

Question No. 926: There are two thermometers in the liquid line leading to our brine cooler. One is located ahead of the expansion valve and the cooler. I notice that when the temperature of the ammonia after the expansion valve is 20 degrees that I do not get the brine as cold as when the ammonia temperature is up around zero. It seems to me the colder I get the ammonia the colder the brine should be, but it works just the other way. There is something screwy about this. Another thing, the temperature before the expansion valve does not seem to have anything to do with the brine temperature. What good is it in the line?—M.N.L.

Temperature of Liquid Before Expansion Valve

Question No. 927: In question 926 M.N.L. asks what good is the temperature of the liquid before the expansion valve. This question deserves a separate answer.—M.N.L.

News Notes and Chapter Activities

Los Angeles

FRED HERR

A STRANGER passing the entrance to the Terminal Club auditorium in Los Angeles on the night of May 21 would probably have been nonplussed for a moment as he saw a group of some 50 otherwise dignified looking men wiggling rubber bands in the air and then rubbing them against their cheeks.

The occasion was the educational session of Los Angeles Chapter, NAPRE, and the rubber band routine was being conducted at the behest of D. D. Wile of Refrigeration Engineering, Inc., as a preliminary to his illustrated talk on "Evaporative Condensers — Research, Design and Operation."

After being introduced by Regis Gubser of the California Consumers Corporation as a two-time winner of the NAPRE technical paper award, Mr. Wile momentarily puzzled his audience by having Secretary Donald Byl distribute a single rubber band to each person present. One of the simplest fundamentals of refrigeration can be demonstrated with a rubber band, Mr. Wile declared . . . the principal of cooling by evaporation. By waving the rubber band horizontally in the air for a moment, then applying it quickly to the cheek a cool effect would be felt. By stretching the band to its full length several times, then touching it to the cheek, a different effect would be felt, Mr. Wile announced.

Fifty-eight members and guests waved and pulled 58 rubber bands for a few moments and then laid them against their respective cheeks. It worked, too, according to the nods of agreement coming from the experimenters.

Mr. Wile used the novel rubber band routine as an effective demonstration of the principles of evaporative cooling. He then proceeded with his scheduled talk on evaporative condensers.

Mr. Wile drew upon his 34 years experience in the refrigeration industry, which began when he served as a shop helper in the plant of the Henry Vogt Machine Company in Louisville, Ky., in 1918.

In his talk he covered the subject of evaporative condensers in general, as well as the compressors produced by his firm. He related some of the problems his engineering staff has encountered with respect to evaporative condensers, discussed performance of condensers, and concluded with the presentation of a number of suggestions on how to get the best work and value out of an evaporative condenser.

He devoted the major portion of his time to a technical discussion and description of engineering drawings of evaporative condensers which were projected on a screen. The slides showed designs of conventional models as well as a number of off-the-beat ideas that his firm has used to solve specific condenser problems.

The business session, which was called to order by President Edgar M. Marrs, at 8:00 p.m., was attended by 58 members and guests. Receiving a hearty welcome was Honorary Member J. Wesley Lamphier, who attended his first meeting in six months.

Herbert N. Royden reported the death from a heart attack on May 9 of Chapter Member Hayes T. Cory of the Baker Ice Machine Company.

Three new members were initiated and one reinstatement approved. Membership Chairman W. R. Burnett reported a total of 30 new members thus far in the campaign—19 produced by the Union Ice-California Consumers team, and 11 by the Independents team. Donald Byl of Union Ice Company leads the chapter in individual effort by a wider margin than Hill Gail in the Kentucky Derby. Don has accounted for 12 new members.

As the opening gun in a special drive, the Chapter in May sent out an artistic mailing piece to all members designed to stimulate the campaign and save Ray Burnett, membership committee chairman, from a ragging when he gets down to the 1952 convention in Dallas, Tex., this fall, he being a native of the 1952 convention city.

The mailing piece was a work of art from the stylus of E. T. Quinn. At the top of the 8½x11 inch sheet six cactus plants were ranged romantically against a Texas horizon. In the midst of the sand and cacti stood Burnett in 10-gallon Stetson, chaps, spurs and double-holstered gun-belt, blazing away with two six-shooters at some road-runners or jackrabbits not visible in the scene.

The speaker at the June 4 meeting was Henry Hawkins, head of Hawkins Chemical Company of Los Angeles. Mr. Hawkins presented an excellent talk on water treatment problems, particularly as they apply to the Los Angeles area and their effect on the ice and refrigeration industries. He distributed a chart to each member and guest which showed a Los Angeles water analysis from its several sources—the Colorado River, Owens River Valley, etc. He also displayed and gave an interesting demonstration of his chemical proportioning pump using automatic impulse pumps.

The preliminary class (7:00 to 8:00 p.m.) had an attendance of 15 for whom instructor Jack Snyder offered a talk on compressor indicator cards and dual compression, from Chapter 6 of the Guy King book.

President Edgar M. Marrs of the Union Ice Company called the business session to order at 8:00 p.m., with 36 members and guests present. Application for membership was received from George L. Duke, which was approved.

Presiding officer Marrs called attention to the full course in steam plant operation, refrigeration operation and electrical maintenance being offered at the Los Angeles Trade Technical School (Where NAPRE member Alex M. Shears is refrigeration instructor) and urged all interested to investigate the possibilities.

As the concluding phase of the program, Ralph Moore and George Paulick of the California Consumers Corporation collaborated in showing a film entitled "Highest Artificial Ski Jump," which had been taken at the 1951 Los Angeles County Fair in Pomona, Calif.

The June 4 meeting was the last business and technical session on the chapter's pre-summer schedule. The last assemblage was Old Timers Night June 25 at which, by long-standing custom, all business and technical matters are side-tracked in favor of a reunion with old companions in the industry and the enjoyment of an entertainment program and dinner prepared under the capable direction of Ed L. Nelson's entertainment committee.

St. Louis

K. M. HOLADAY

AN 80 PERCENT increase in membership during the past year was reported by Eugene Bishop in relinquishing the gavel as chairman of St. Louis Chapter to Charles Wunderlich. Speaking at the annual election meeting May 23, with justifiable pride in the chapter's growth, Bishop pointed out that a major factor in holding the interest of older members and attracting new men has been the excellent educational program presented by John Dabbs as instructor of the new study course. In accepting the gavel, Wunderlich admitted that it has become a challenging job to head the St. Louis Chapter organization, and promised a varied program that will appeal to the interests of all members.

The meeting was held at the Falstaff Brewing Corporation Plant No. 5. where the hospitality room is ideally suited to the sociability which has always characterized the annual election meetings of the chapter. Hosts were Past-President Charles H. Bergmann, chief engineer of Falstaff Brewing Corporation, and Charles Taggart, chief engineer of Plant No. 5. Members were especially interested in the top-to-bottom tour of the plant which highlighted the evening's program. After observing the process, we enjoyed the product served up with a tasty lunch to climax the tour.

A number of very attractive attendance prizes varying all the way from firewater to home-grown strawberries were donated by the following members to spice up the evening and keep the speeches from dragging: Gene Bishop, N. O. Nelson Co.; Ray Cambron, Thermal Engineering Co.; Bob Ellis, Taylor Instrument Co.; Les Fleiter, L. V. Fleiter Co.; J. Lang Holke, Carl F. Gast Co.; Harry Kroll Star Iron & Metal Co.; Jimmy Lyle, Henry Vogt Co.; Charles Wunderlich, R. H. Spangler & Co.

Swift & Co. has stepped out ahead

as the organization represented by the largest number of members in St. Louis Chapter. The following roll contains the names of several charter members as well as new recuits. All cross the river from East St. Louis regularly to attend chapter meetings and classes: Marvin Arnold, stationary engineer; *Charles Barnard, asst. boiler & engine room foreman; Robert A. Best, draftsman; *Bryan Elliott, mechanical engineer; Charles Franklin, oiler; Walter Goetz, oiler; Joseph Melancon, refrigeration service man; *Erwin Menzenwerth, boiler & engine room foreman; Wilbert Siesennop, Estimator; *Stanley Tatalovich, pipe shop foreman; *Gurdon F. Uplinger, Chief engineer; Frank Vitt, electric shop foreman; John Wilson, head oiler. (*Charter Members). With these 13 members, the Swift crowd now has the honor long enjoyed by Falstaff Brewing Corporation with 9 members on the roll.

Les Fleiter, Chairman of the Nominating Committee, announced the findings of the election tellers, and declared the following officers elected for the ensuing year.

Chairman, Charles Wunderlich, R. H. Spangler & Co.

Vice-chairman, Eugene Kessler, Falstaff Brewing Corp.

Secretary, Stanley Tatalovich, Swift & Co.

Treasurer, E. W. Acey, Southwestern Bell Telephone Co.

Sergeant-at-Arms, Lester Lanser, Pevely Dairy Co.

Director, John T. Dabbs, (Unexpired term) York Corporation.

Director, John D. McCarthy, (2 years) Frick Company.

Rio Grande Valley

ARMEN DONERS

THE Rio Grande Valley Chapter began its fifth year of activities at its meeting of May 13. This first meeting of the new fiscal year was a gala occasion celebrated by a dinner-meeting, well attended by members and friends at "El Sombrero" in Mercedes, Texas.

The high point of the meeting came when Instructor John Muller presented our good friend and illustrious member, R. A. O'Neill. "R.A." made a special trip from Corpus Christi to be with us and assure a fitting installation of the newly elected officers for the coming year. He explained that before leaving Corpus Christi he had taken special pains to ascertain whether the newly elected officers were suitable men to staff the Valley Chapter. He consulted the NBIPRE (National Bureau of Information on Practical Refrigerating Engineers) and secured a confidential report on each man. These reports, complete with details on habits, disposition, special skills or peculiarities, weaknesses and appetites Mr. O'Neill brought along for the scrutiny of all present, and invited everybody to try to identify the officer who was described by each report.

It would not be fair or fitting for us to reveal in print all the intimate and lurid details of these investigations of NBIPRE, but there were some characteristics that seemed to be possessed by all the new officers in common. Each appeared to have the welfare and progress of NAPRE at heart; each was reported to have an insatiable thirst for knowledge or just an instatiable thirst; each had in one capacity or another demonstrated a love and loyalty for the Rio Grande Valley Chapter in the past.

After a thorough scrutiny of these reports the members gave their approval of the new officers and "R.A." gave them his blessings. He stressed the heavy responsibility which was being laid upon them and charged them with energetic, conscientious and harmonious cooperation to assure the further growth of the Rio Grande Valley Chapter, and he stressed the fact that with NAPRE's full program and many benefits it should not be difficult to lure more prospective members into the fold. Mr. O'Neill remarked several times during the meeting on the good work that had been done by the Chapter's officers last year, and congratulated them for a fine job.

In conclusion Mr. O'Neill reported that Central Power & Light Co. had picked up the check for this evening's dinner and refreshments with the proviso that the sum thereby saved by the Chapter treasury be placed at the disposal of some worthy member for his expenses to the NAPRE Convention in Dallas.

The new president, Armin Doneis, thanked Mr. O'Neill in behalf of the chapter and asked him to convey thanks to the CP & L Co. for its generous help. He then called on all officers for remarks suitable to the occasion, and invited the non-member guests to express themselves. R. L. Brown, local CP&L Manager of Raymondville suggested that more new members would be encouraged to join NAPRE if we made our appeal directly to the managements of the Valley firms. E. W. Franke, general superintendent of Ice Division from Corpus Christi, expressed his surprise that the large majority of the members are CP&L men. He asked "Why aren't the independent ice manufacturers more fully represented here? Thay have as much to gain from NAPRE as anybody else!" To this Jim Sweeney, CP&L's ice sales supervisor for the Valley agreed heartily and expressed willingness to cooperate with Mr. Casberg in calling in the managements of the independent firms in an effort to win their support and cooperation in NAPRE's program. In the ensuing informal discussion the point was brought out that our chapter is in no way limited to ice-plant engineers, but that food freezer operators and air-conditioning men as well as domestic and commercial refrigeration servicemen could benefit equally by taking part in our work. The meeting broke up at a late hour after more talk about future strategy.

At the meeting of May 27, two generous offers were extended to stimulate a drive for new members. R. A. O'Neill started the ball rolling by putting up $15. to be paid to the man who recruits the largest number of members to the R.G.V. Chapter within the next sixty days, provided that at least ten new members are won. A. M. Casberg rose to the occasion with an equal sum to be split into $10.00 and $5.00 awards to the runner-up as second and third prizes.

In compliance with the proviso of Mr. Randolph of the C.P.&L. Co. who footed the bill for our special dinner meeting in Mercedes, the chapter officially agreed to tax each member who attended the Mercedes meeting $1.25, the total proceeds to be set aside and earmarked with an equal amount out of the treasury, to be used for defraying the travelling expenses of a deserving member of the chapter to attend the Dallas Convention of NAPRE next autumn.

(Continued on page 58)

Official representatives of Rio Grande Valley Chapter N.A.P.R.E. which held a dinner meeting and installed officers at "El Sombrero" restaurant, Mercedes, Tex. May 13. Left to right: R. A. O'Neill, A. M. Casberg, O. I. Albright, B. F. Wilson, A. F. Doneis, Clyde Young.

Memphis

CHARLES CONLEY

MEMPHIS Chapter has not recessed for the summer vacation period and is concentrating on the Refrigeration Course. The last meeting in May was devoted to compressor design and the instructor, H. L. Todd illustrated the lecture with a small vertical twin cylinder York compressor and a Kelvinator Rotor type compressor. B. E. Talbert, air conditioning engineer was welcomed to membership at this meeting.

The subject was continued at the first meeting in June. Alvis J. Clay, national first vice president is home recuperating from an appendectomy. You have our best wishes for a speedy recovery, Alvis and all of your friends hope you will be back on the job shortly.

Technical Sessions and Informal Conferences Make Interesting Spring Meeting for A.S.R.E.

THE 39th spring meeting of the American Society of Refrigerating Engineers was held at the Hotel Atlantic-Biltmore, Atlanta, Ga., June 1-4, 1952. The program consisted of a general assembly, technical sessions, conferences and welcome luncheon, inspection and sight-seeing trips, committee meetings, and the usual President's reception and traditional dinner dance.

Tuesday afternoon was devoted to the golf tournament, a trip through the Lockheed Aircraft Plant and a trip through Georgia Institute of Technology, particularly the low temperature research laboratory where they are able to produce temperatures down to about 2½ degrees of absolute zero for research and test purposes. This party also went through the new textile laboratories at Georgia Tech.

In addition to the laboratories themselves, this building includes a model textile mill in which cotton in the raw state is brought in, carted, spun, woven and knitted by several different processes and methods.

Tuesday evening the regular dinner-dance was held following a cocktail party. Spirituals were sung by the Bethel Choir and this proved to be an outstanding event and greatly enjoyed by all.

Although not on the program, the city of Seattle ran a colored sound film showing scenes in and around Seattle, including some of the Seattle industries.

The Spring meeting for 1953 is to be at Lake Placid, New York, and Seattle made the strongest bid for the Spring Meeting in 1954. Los Angeles made a bid for the 1954 Spring Meeting, but to be held in Las Vegas, Neveda, under the joint sponsorship of the Los Angeles and San Francisco Sections. However, it appeared probable that the 1954 Spring Meeting will be held in Seattle, although it was left to the decision of the executive committee

Technical Papers

A paper on Fundamentals of Refrigerant Piping was presented at the first general assembly by C. W. Leegard of General Electric. Mr. Leegard pointed out that many compressor failures are caused by poorly designed refrigerant piping systems and that a number of broken compressor valves and burned out compressors can be reduced if contractors and installers know how the job should be piped and what would happen if bad piping practices are used. The paper outlined the fundamentals of refrigerant piping for Freon 12 and Freon 22 and pointed out how certain pipe defects affect compressor operations and in some measures cooling unit or evaporator performance.

Properties of Freon

At this session also a paper on Generalized Pressure, Volume, Temperature Properties of the Freon Components was presented by B. J. Eiseman of the Du Pont Company. Mr. Eiseman showed a series of generalized graphs which can be used to estimate P-V-T properties of halogenated hydrocarbons in both the saturated and superheat regions, when experimental data are not available. The accuracy of the estimated data, he said, will depend on the similarity of the compound in question to one of the various groups of Freon compounds for which data have been given.

The uncertainties are greatest at high densities and pressures, where there are only limited data, and may amount to 10 percent or more in part of the super-critical region. Below the critical temperature and pressure the Freon data are not in error at any point by more than about five percent and at pressures from about one half the critical downward, the accuracy of the basic data is about one percent. If exact data are essential, measurements must be made to confirm the estimates described above. These estimates will serve as a useful guide in determining the key experimental measurements for establishing the required accuracy with the minimum of work. The approximate estimates themselves will be found to suffice for most purposes.

Carl F. Alsing, with a paper on Automatic Defrosting for Domestic Refrigerators reviewed some of the various designs that had been used and some of the desirable features of automatic defrosting. He particularly stressed customer instruction and that the time of defrosting depended upon the length of food storage.

S. J. Williams of International Harvester showed equations and pressure-enthalpy diagrams applying to several types of automatic defrosting viz time only, electric heat to the evaporator shell, an electric heater to the capillary tube outlet, hot gas and reverse cycle. It was his intention that engineers should use these equations for analyzing the efficiency of their defrosting cycle and to analyze the cost of automatic defrosting. He also pointed out that plotting the defrosting cycle and the refrigeration cycle on the pressure-enthalpy diagram is very helpful to the design engineer.

R. G. Raney of Ranco discussed the design of refrigerator automatic defrost controls and mentioned that there were now about 150 patents on defrost systems. His talk was based primarily on synthetic controls mounted on a board. He mentioned that the "fail safe feature" is incorporated into present day controls and this involves a power element pressure less than atmospheric so that if the control fails, it returns to the "off" position, thus preventing overheating of the evaporator by the electric heating element. The present day synchronous motors he said, are much more quiet in operation than the early ones and this is a factor to be considered. He mentioned also in addition to the fully automatic control setting, a timer to start and a thermostat to stop a control, we now have the semi-automatic which is started manually and is stopped by the thermostat.

New Silicon Finishes

O. J. Spawn of Du Pont, discussed the effect of the new silicon finishes for the evaporator to facilitate run-off of the water from defrost. However, since this paper was prepared, they had made some recent studies on the use of Teflon coatings for evaporators, and it appears to be considerably superior to the silicon in that the water forms in globules on the Teflon and runs off much more easily. Teflon is one of the new plastics that is put on the evaporator and baked at 350 F. It can be used with aluminum, zinc, brass or steel. He mentioned that Teflon is now being used for coating breadpans by commercial bakers, who are able to get almost two-thousand bakings from the pan without greasing the pan. It is also used as an insulation for wire in that it stands high heats.

Customer Reaction

Not included on the original program was a talk on "Customer and Dealer Reaction to Automatic De-

frosting" by Miss Willie May Rogers, Chief Home Economist of Admiral, and she really stole the show. She "told off" the engineers and made them like it. After her talk there was a very animated questions-and-answers period. In her opinion, the accumulation of icicles that apparently occurs on most evaporators of household refrigerators equipped with automatic defrost systems, is the number one objection of housewives to automatic defrost systems as now applied.

Miss Rogers pointed out that women are very literal minded and if they are told that a refrigerator automatically defrosts itself, and relieves them of the bother of doing so, they expect it to do just that and they do not expect that every two, three or four weeks, they will have to defrost it by hand to get rid of the accumulation of icicles on the bottom of the evaporator, and they don't like to find the foods re-frozen together inside the frozen food compartment. She made these statements as a result of a survey of women that have used automatically defrosted refrigerators for at least three months.

Defrost Systems

J. R. Hornaday of Norge reminded the group that Norge was the first to provide a household refrigerator equipped with automatic defrost using the simple shut-down method by means of a timer starting at 2:00 a.m. and continuing for a period of several hours thereafter. Their present type, however, is the electric defrost method using a 350 watt electric heater.

Milton Kalischer of Westinghouse described the Westinghouse method of using an electric heater at the outlet of the capillary tube with the defrosting timed by the number of door openings.

A paper on the Crosley system prepared by A. J. Pfeiffer was read by Walter Kinsley, assistant to the director of appliance engineering, Crosley. This system uses a time clock to indicate the defrost with a thermostat to end it and in addition another safety thermostat. Tests have shown that during defrosting, the air in the frozen food compartment rose a minimum of 10 F and a maximum of 40 F, but that the frozen foods themselves rose from 9 to 11½ F.

H. R. Ball in his description of the defrost system of International Harvester mentioned that they used an electric heater on the evaporator and on the drain pan. It was timed to defrost at 3:00 a.m. and last for twenty-five minutes, but that the thermostat interrupted the defrost much sooner and in fact, usually after about twelve minutes. Their system includes vaporizing the drain water in the machine compartment.

Manpower Shortage

The speaker at the noon luncheon on Monday was Colonel Blake R. VanLeer, President of Georgia Institute of Technology on the subject of "The Technical Manpower Shortage." He pointed out that among the reasons for this shortage was the recurring one that there was always a shortage of technical manpower in critical periods of defense preparation, industrial expansion, etc., due to the heavy demand for technical personnel. He also pointed out that the army, navy, air force, and other government projects were taking vast numbers of engineering graduates.

As another reason for shortage of engineers he feels that the quality of the students sent to the colleges is not as good as it used to be and attributed this partially to inadequate common school and high school preparatory education and also to the fact that there is today a lower birth rate in what he referred to as the more intelligent classes. Still another reason for the shortage of engineers is the tremendous number of men that are presently engaged in Government research work.

Evaluating Refrigerator Oils

Dr. H. M. Elsey of Westinghouse presented a new method of evaluating refrigerator oils for stability. He prefaced his remarks by saying that the methods described in this paper were brought about by their attempts to overcome some of the early lubrication troubles. Apparently in the past, it has been assumed that there was little or no reaction between "Freon-12" and the mineral lubricating oils, but their tests appear to indicate otherwise.

He described their test which included the use of the Phillips and Tiffany tube in which the refrigerant and oil are sealed and in this refrigerant-oil mixture in the tube, they placed various metals. They had expected that there would be considerable reaction on the copper but they found that there was very little and they found this same thing true of aluminum and brass. However, when they put a piece of wire in the sealed tube with "Freon-12" and the oil, they found a very active reaction.

After testing nine oils that they used in their high temperature air-conditioning equipment, they then tested their oil that they use in their household hermetics and found that the iron acts as a catalyst to promote very active reaction between the oil and the "Freon-12." They find that the "Freon-12" is not stable in the presence of an oil and that some of the chlorine and fluorine atoms of the "Freon-12" are lost to unstable atoms in the oil and this of course is particularly true in the more unstable type of oil tested.

He pointed out that the "Freon-12" is consistently pure drum by drum but this is not true of the oils. They vary a great deal from one shipment to another and many times the refiner himself does not know that there is any variation.

C. M. Bosworth of Carrier presented a method of predicting the behavior of oils in refrigeration systems with particular reference to the separation of the oil and the refrigerant and the absorption rate of the refrigerant into such materials as gaskets, etc. His conclusions were that the paraffinic oils absorb less of the halogen refrigerants such as the "Freons" having a tendency to separate less and to have less effect on rubber, whereas the napthenic oils tend to absorb more refrigerant, separate out more easily, and have a greater effect on synthetic rubbers. He felt therefore that hte napthenic base oils were better for low temperature work.

Making Liquid Oxygen

Dr. Irving Roberts of Mellon Institute of Pittsburgh, described and showed slides of plants for making large quantities of liquid oxygen. The process is principally that of fractionation, but also includes the use of a turbo-expander, which operates on the old dense air principle and is the means of introducing the outside energy and power necessary to operate the plant.

The plants described by the author are made in sizes of from a very small plant producing ten tons of liquid oxygen a day to large plants producing a thousand tons of liquid oxygen per day. A great care must be taken in avoiding pressure drop and to do this the piping circuit has to be very carefully designed. Moreover, its design requires that it be as compact as possible so as to present the minimum amount of surface and thus reduce heat leakage to the very minimum. Heat leakage accounts for a very large percentage of the power required to operate the plant and is the percentage of power that is controlled, for the remainder of the power required is used in overcoming the internal energy of the air.

Air is drawn into the plant and by fractionation and the use of the turbo-

expander air cycle, liquid air is produced at approximately –300 F. Part of the process involve the use of liquid nitrogen which flashes at –316 F. The plant makes both liquid oxygen and liquid nitrogen and, in fact, the end production is 38 percent liquid oxygen and 62 percent liquid nitrogen.

G. P. Marcy of Westinghouse, described a new cold box calorimeter in which a secondary refrigerant circuit is used but with an additional secondary tank. It appeared to be rather complicated, but he maintained that it was actually more simple to use and more accurate in measuring the heat leakage of a refrigerator analyzing with normal operation of that refrigerator.

Packaged Air Conditioner Conference

E. A. Freund of the Union Electric Company, St. Louis, spoke on the present and future markets for all year 'round residential air conditioning and particularly from the viewpoint of the electric utility companies. It was his opinion that the industry has great volume possibilities and that it represents an enormous potential load for the electric utility companies, although it is not as desirable as some of the other household appliances in that the home air conditioner is likely to impose heavy peak loads.

H. C. Pierce of Servel described the Servel gas year 'round unit and said that it was their experience that most of the difficulties arise from mis-application and he particularly pointed out the duct system as being a somewhat critical problem in many homes. He stated that the extended plenum appeared to be best in order to get balanced air distribution. He also pointed out the difficulty in the volumes of air to be circulated for winter heating and summer cooling. He emphasized the necessity of proper design of the duct system and the grilles to obtain quiet operation. He recommended no more than a 35 inch static pressure and air changes of from six to eight times per hour. He brought out the variation in room loads at different times of the day. He also mentioned that as simple a control system as possible was desirable for residential year 'round conditioners.

G. K. Marshall of General Electric spoke on the all-electric year 'round air conditioner and he described the General Electric air-to-air type heat pump which changes the refrigerant flow in order to switch from heating to cooling or vice versa. Originally, they came out with a 3 hp unit, but now also have a 5 hp. Based on a 95 F. outdoor dry bulb, the 3 hp unit delivers 33,000 Btu per hour cooling and the 5 hp, 56,000 Btu per hour cooling. They get a coefficient of performance of about 3. The installation of the 3 hp system costs about $2600, and the 5 hp system about $34.00. Since there is an air-to-air system, they can supply residence heaters where required to supplement the heat pump in unusually cool weather.

S. F. Shawhan of Carrier spoke on the combination type of gas and electric, which combines a gas heating unit with a conventional compression type air conditioner. He mentioned the need for zoning in large homes and recommended a separate systems for each zone. He particularly mentioned the variation in loads of certain rooms or portions of the house at different times of the 24 hours and as an example, referred to those during which cooling loads are imposed upon the living room. He suggested the possibility of deflecting cooled air from bedrooms to living room and dining room for these peak load conditions. He stressed the necessity of a much lower noise level for homes and for commercial air conditioning installations and stated that whereas 40 decibels would be considered low on a commercial installation, 25 to 30 decibels would be high on a residence installation.

Packaged Air Conditioners

S. W. Reid of York discussed the application of packaged air conditioners to existing forced hot air residential heating systems. He brought out that residential loads were chiefly from the outside,—that is, heat leakage, ventilation loads, etc. He also mentioned the need for increasing the volume of air handled during the cooling period over the heating period and stated that this could be done in many instances by increasing the fan speed. He referred also to the need for insulating ducts going through hot areas in order to prevent excessive cooling loads. They found that locating the cooling unit upstream from the furnace would be the best location, but this provoked considerable controversial discussion.

C. T. Baker, consulting engineer of Atlanta, told how safety provisions in the B9.1 Code, if followed, would have prevented a number of accidents that he described. Many of these accidents occurred through such disregard for safety measures as shutting off hand valves ahead of relief valves, capping up the outlets of relief valves, over size motor protectors, short-circuiting relief devices, etc. He felt that better education on the part of many of the people who use, install and service refrigerating equipment in the provisions of the code would have prevented some of these accidents.

A special sound slide film prepared by the Atlanta Chapter of RSES, had as its theme the potential hazard to young children from abandoned refrigerators. It showed many of these old refrigerators in which children had smothered. The voice pleaded for removal of the hinges and latches to render these death traps harmless.

L. E. Brownell, University of Michigan, supplemented his report on atomic irradiation of foods that he originally presented at the New Orleans meeting last December. He reported progress and improvements in the process and stated that some foods could not be irradiated successfully with imperciptible change in appearance, odor, or taste, and specifically cited bacon and ham. Many foods are, however, changed in appearance or taste and he feels that a great deal of research must still be carried on before foods can be properly preserved by atomic irradiation. He felt that it would be at least five years before the process became a practical one and that the speed of development depended largely upon the availability of the radio-active materials.

Chicago Section Award

H. J. Prebensen announced that the Chicago Section had arranged an award known as the Chicago Trophy for the ASRE Section that during the year made its greatest improvement in membership. This award in the form of a bronze plaque would be presented to the winning section at the winter meeting in New York early in December. The plaque passes yearly from one section to another unless a section wins the award two years in succession, in which case they are permitted to retain the plaque.

C. P. Goree of the Frick Company in Atlanta, described the poultry raising industry in Georgia. He brought out that last year, 1951, Georgia led the nation in poultry raising, having passed Delaware, the previous leaders and that Georgia raised one-hundred million birds in 1951. He described the remarkable change that the poultry business had had on certain areas in Georgia, particularly the Gainesville area.

He was particularly interested in the freezing of poultry and stated that the air blast method at temperatures of from –20 to –40 F appeared to be best, using an air velocity of 800 feet per minute over the coils and approximately 250 feet per minute over the chickens.

FrozenFoods
*Reg. U. S. Pat. Off.
PREPARATION PACKAGING FREEZING STORAGE DISTRIBUTION DESIGN CONSTRUCTION EQUIPMENT

Canadian Freezing Operation

Crescent Cold Storage Plant at Winnipeg, Manitoba, Canada furnishing outstanding example of efficient food freezing and refrigerated warehouse operation. Many new features and modern equipment make for ease of handling products in and out of storage

ONE of the most up-to-date Canadian refrigerated warehouses, the Crescent Cold Storage, Ltd. is located at Winnipeg. It furnishes an outstanding example of efficient operation, through its large freezing and storage capacity and the cleanliness of the large plant with its varied food processing operations.

A total of 198 h.p. comprised of eight 7½ h.p. units, six 15 h.p. units, two 10 h.p. units, and one each of 20 h.p., 5 h.p. and 3 h.p. making nineteen compressors in all provide the refrigeration for the four floors and basement rooms of Canada's largest freezing plant.

The plant is located centrally in Winnipeg's industrial district at Princess and Logan streets. Under the capable managership of H. Toole the largest volume of food frozen in any single Canadian plant is handled in the four-story building.

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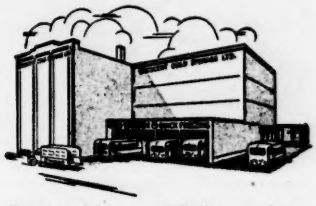
Freezing Capacity

Freezing capacity is 110,000 to 120,000 pounds in 24 hours. Since the plant was opened in 1946 the amount of produce frozen has increased each year. Over 5,000,000 pounds were processed in 1946. In 1947 the figure jumped to 9,000,000 pounds and in 1948 it was up to 15,000,000 pounds. Most of the produce was carcass beef for shipment to Europe and Asia handled for other packing plants who lacked adequate facilities.



Exterior of Crescent Cold Storage plant—From an actual sketch.

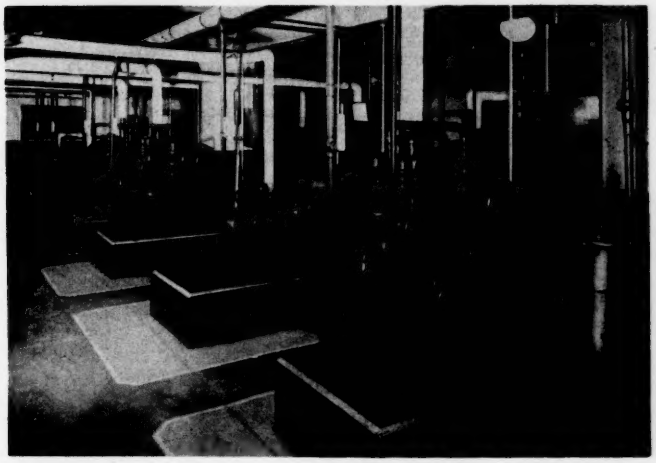
Full Floor of Freezers

Eight separate blast freezers located on the main floor look after the sharp freezing. Four of these have 400 sq. ft. floor area and each is cooled by an Acme water defrost blast unit operating off a 15 h.p. compressor. The two largest blast freezer rooms are 700 and 600 sq. ft. in area. They have two Acme blast units each with compressors on each room totalling 30 h.p. The "babies" of the blast rooms are two of 360 sq. ft. floor area each having one blast unit with a 15 h.p. condensing unit.

In addition to these freezers there is a sub-zero storage room on the main floor with a 700 sq. ft. area cooled by banks of Dole plates. Six other frozen storage rooms are located two each on the second, third and fourth floors of the Crescent building. Each of these floors has a capacity of 1,350,000 pounds of frozen food. All these rooms are thermostatically controlled and while they are maintained at zero degrees temperature this can be raised or lowered as desired. All cooling in these sections is by Dole plates.

Frozen Eggs

While frozen meat is the biggest processing job, another sizable operation is the production of frozen egg



Compressor room in refrigerated warehouse of Crescent Cold Storage Ltd., Winnipeg, Canada. This view shows a few of the battery of nineteen Frigidaire compressors which provide refrigeration for rooms on four floors and basement.

Eviscerating Department: Here poultry is eviscerated, cleaned, sectioned, packed and weighed. Equipment can be changed over to provide facilities for frozen egg melange.

melange. When the egg-breaking room at Crescent isn't in use for preparation of the melange it can be converted in a matter of minutes to the job of eviscerating poultry. This poultry business is a going concern.

Chams Frozen Poultry

Sixty to seventy people keep busy preparing chickens for Winnipeg's first commercial pre-packaged frozen poultry business. Chams Chicken, as it is called, is a favorite in many of the west's retail frozen food outlets. The fowl is eviscerated, sectioned, packed and frozen in the plant. Cham brand poultry goes to the consumer in two forms, frying chicken and fricassee fowl. This is a big seller and production has its hands full keeping up with demand. Two government inspectors are required to spend full time on this job alone in the storage. This egg-breaking and eviscerating room is tiled, air conditioned and has fluorescent lighting.

Fresh eggs and other unfrozen perishables are stored in large basement chill rooms. There are five of these held at a temperature of 35 F. Holding room floor areas are 404 sq. ft., 548 sq. ft., 628 sq, ft., 790 sq. ft., and 1630 sq. ft. They are all cooled with Frigidaire forced air cooling units that are ceiling-mounted. Coils were all figured on a high humidity, limited storage basis.

Butter Storage

Butter is another big storage item at Crescent. It is brought in in carload lots, blast frozen and then stacked in zero holding rooms. Here are the freezing times on some of their products in this giant food center; carcass beef, 18 to 24 hours; lamb and pork, 12 to 18 hours; 38 pound can of egg melange, 24 to 36 hours, with top bacteria count test; poultry in fifty pound boxes, 24 to 36 hours.

Overhead Tracks

They have top-notch facilities for handling food-stuffs at the plant. Produce is unloaded at the convenient C.P.R. siding which is at the rear door of the building. Once inside, the great tonnage of produce can be efficiently routed throughout the plant.

Winnipeg's cold city water gave Crescent a bit of trouble in defrosting at first. To overcome the problem, a large water tank was installed and the waste water from the condensing units was piped into it. The water in this tank is always warm and is used to defrost the blast units.

Until last summer the water tank had an overflow leading to the sewer. Then a Marley cooling tower was installed implementing a great saving in water to the city and in water cost to the firm. Now the water from the tank is pumped to the cooling tower instead of the sewer.

For an installation with nineteen compressors cooling as many rooms in such an active freezing and storage plant as this, the refrigeration job has been amazingly successful and trouble-free. As for the success of Crescent's business, the increasing value of frozen produce handled by Winnipeg's freezing giant speaks for itself.

Oyster Freezing Plants Combined

THE specially breaded oyster freezing and frozen fried oyster packing processes of the Willapoint Oysters Inc., and Pacific Pearl Frozen Foods Inc., have been consolidated and combined in the freezing plant of the Coast Oyster Co. at South Bend, Wash. The frozen fried oysters are being packed under the "Pacific Pearl" trade name, while the frozen breaded oysters carry the "Willapoint" brand.

Holding room: Zero storage room on main floor has 700 sq ft floor area; cooling by Dole plates.

Blast freezer: Frozen egg melange shown in one of eight blast freezers at Crescent Plant.

Food Distributors Turn Attention to Frozen Food Marketing Problems

THE serious marketing problems confronting the frozen foods industry can be solved only through a realistic program of cooperation between packers, distributors and retailers," declared the National Food Distributors Association in a pre-convention Executives Meeting in New York on May 31, 1952. At this meeting the Association announced that the forthcoming Silver Jubilee Convention to be held at the Hotel Sherman, Chicago, August 11-14, will include special panel discussions on all phases of the frozen food business in a frank spirit of give and take inquiry, aimed at reconciling various divergent views and finding sound workable solutions.

"Reducing prices to the consumer at the expense of distributors' minimum operating margins undoubtedly will result in the loss of markets for little advertised brands," an N.F.D.A. spokesman said. Distributors are victims of a squeeze play between competitive frozen food packers who do not realize that when the merchandising services that established distribution are withdrawn, their own brands will have slight chance of survival in the battle for markets between advertised industry leaders.

Specialty Foods Replacing Staples

Marketing specialists of the industry attribute the trend of increasing specialty sales to increased distributor promotion of; cooked, frozen, ready-to-heat-and-serve, and other frozen specialties brought about by the higher distributor-retailer margins on these items. Distributors feel that price competition on staple fruits, vegetables and meats has squeezed the profit out of these items. One large operator queried on the subject said, "The truth of this is evident by what is happening now to frozen citrus products."

In a feature article "What Price Distribution?" in the current issue of the N.F.D.A. Journal, M. A. Corbett, Frozen Food Consultant to the association and former head of the Frozen Food Section, War Food Administration outlines the historical development of distribution pioneered by its members and took issue with some industry spokesmen who attribute the industry's distribution problem to growing gains and the so called retail bottle neck. Mr. Corbett, who initiated the store-door-method of frozen foods distribution during the early thirties, said, "These same time worn explanations have been used to describe recurring industry problems for over fifteen years." The distributors' group labeled them futile and inconsistent with the realities of present day merchandising.

Frozen Food Institute

Mr. Corbett recalled that in 1938 at the N.F.D.A. convention in Cleveland, Ohio, it's frozen food distributor members suggested formation of a National Frozen Foods Institute participated in by all segments of the industry, in order to solve trade and consumer relation problems similar to those under discussion today. Mr. Corbett also declared, "Today the industry has more need than ever for a comprehensive trade relations organization manned by experienced, working executives who understand the problems of all divisions of the frozen food industry." He further explained that, "The present trade organizations acting primarily as packer's statistical gathering services and the various regional broker-wholesaler groups representing their own interests have failed to act impartially on the whole wide panorama of the industry's distributing and retailing problems."

Another important problem food distributors will attempt to resolve with suppliers at the N.F.D.A. August convention in Chicago concerns the latter's direct sales to chain stores which by-pass wholesalers who originally developed these same outlets into volume frozen foods users. In covering this subject Mr. Emmet Martin, Association Secretary, said, "Time will prove the fallacy of depending on low prices alone to maintain consumer markets that have been cultivated over the years. The danger to the frozen food packer's brand building ambitions is that—chain store merchandising techniques often tend to switch consumer sales based on price alone, so that specific brand preference may become meaningless."

Modifying his statement to exclude quality brands enjoying strong consumer demand in local markets based on sound advertising and merchandising cooperation between distributors and retailers Mr. Martin stated, "Packers seriously intent on creating a permanent consumer franchise should learn to recognize the important role store-door-distributors play in opening and holding markets for scores of trade-marked products."

Taking note of the confused thinking, as expressed at a recent meeting of the frozen foods industry with regard to home freezer promotional "Ballyhoo" designed to by-pass retailers, an N.F.D.A. Executive, whose organization is a large frozen food operator, said, "Industry factors who recently lent assistance to such unsound promotional schemes do the industry irreparable harm and it is a mighty good thing the U. S. Government has interested itself in such schemes."

Years ago many responsible grocery associations encouraged manufacturers of the home freeze "pantry shelf" before some of today's avid promoters found it profitable to pay any attention to frozen foods. They undoubtedly will continue to urge consumers to use frozen foods and encourage retailers to keep their cabinets filled with quality advertised products supplied by distributors, who are better informed on food values than some inexperienced appliance promoters.

The N.F.D.A. has also suggested that its members go on record as warning housewives that, "Wholesale savings claimed for consumers by some promoters of the schemes are often nebulous, and homeowners signing contracts to purchase cabinets should make sure that the promoters possess the ability to deliver frozen foods of standard quality at actual wholesale prices. The situation is fraught with disappointment to housewives if the wholesale savings claimed on the foods is added to the cost of the cabinet or its installation and delivery charges. It is especially important to know if the foods delivered are of inferior quality."

A number of quick frozen food distributors have complained because their names were given to housewives coupled with an unauthorized statement by the frosted food cabinet promoter, claiming that the distributing firms would fill the appliance at wholesale. The distributors advised housewives to consult their local Better Business Bureau.

August Convention

The N.F.D.A. Silver Jubilee Convention in Chicago, August 11-14, will feature exhibits of various frozen foods; perishable and semi-perishables, and specialty ready cooked packaged products and equipment. In view of the numerous problems facing frozen food distribution this year's panel discussions dealing with issues is expected to be attended by frozen food executives engaged in all phases of the industry and from all sections of the country.

Frozen Foods

Use of Antioxidants in the Frozen Storage of Turkeys

CONTROLLED storage studies and industrial experience with frozen turkeys have shown that high standards in processing and in packaging can insure a storage life of a year or longer without objectionable rancidity. Another possibility for control of rancidity, particularly for exposed surfaces of eviscerated and cut-up poultry, lies in the use of antioxidants, which have proved beneficial in a number of fatty foods.

Turkeys are known to be more susceptible to rancidification than chickens and are generally stored for longer periods. Moreover, the trend is toward greater use of evisceration in preparation, and an extension of the market cut-up portions might be stimulated by application of means for reducing the tendency toward rancidity.

At the Western Regional Research Laboratory, recent studies have demonstrated that use of an aqueous gelatin coating containing antioxidants reduces rancidification of the skin and cut meat surfaces of turkey in frozen storage. This method may have the practical value of additional protection during long-term storage or may make packaging requirements less stringent. Data from studies conducted by A. A. Klose, E. P. Mecchi, and Helen L. Hanson were presented by Mr. Klose at the Annual Meeting of the Institute of Food Technologists in Grand Rapids, Michigan, in June.

In their studies they used frozen turkey steaks five-eighths inch thick. In experiments with sprayed coatings, about 2 milliliters of the solution of antioxidant was sprayed on each steak. In dip-coating experiments they immersed each steak for about two seconds in a three percent aqueous gelatin solution of the antioxidants, and the coating was about 0.2 mm. thick. All coatings were allowed to freeze before the steaks were packaged in heat-sealed cellophane. Butylated hydroxy-anisole, propyl gallate, and combination of these antioxidants markedly reduced fat deterioration in frozen storage.

Of the solvents or carriers used, a 3 percent gelatin solution, in which the antioxidants were suspended at about 0.15 percent total concentration, was found to be most effective. The 3 percent coating alone provided some protection, but not nearly so much as the gelatin coating containing suspended antioxidants.

Frozen Vegetable Pack Under 1951 Ceiling Prices

THE Office of Price Stabilization placed this year's early frozen vegetable pack under the 1951 frozen vegetable ceiling price regulation. Price officials said the agency has "removed, insofar as possible, provisions in the 1951 regulation which resulted in unintended rollbacks for certain items" and has amended it to allow an alternative method for calculating price ceilings on items placed on the market since the 1948 base period.

Price rollbacks under C.P.R. 81, the O.P.S. said, resulted from the fact that permitted cost increases over 1948 for other than raw materials were limited to "minor" vegetables, like rhubarb. No increases were authorized for major vegetables which require "considerable hand labor, especially in institutional and bulk sizes." The amendment also redefines container size classifications and makes it clear that processors must file new ceilings under the new pricing methods.

The O.P.S. is "contemplating" issuing another amendment to provide for individual adjustments, it was announced. These actions will service as a pattern for setting processor and distributor ceilings on the entire 1952 pack.

Proposed Standards for Frozen Whole Kernel Corn

THE U. S. Department of Agriculture has announced that it has under consideration a proposed revision of U. S. Standards for Grades of Frozen Whole Kernel Corn. This would supersede standards in effect since April 15, 1944.

Changes have been proposed in the quality requirements for tenderness and maturity and absence of defects. Appropriate changes have been proposed also in the factor of color, to clarify its scoring.

The proposed revision is the result of conferences with the industry and studies made by the Department in response to suggestions for improvements in the grades.

Standards for Grades Of Frozen Lima Beans

THE FIFTH United States Standards for Grades of Frozen Lima Beans have been issued. These standards have been issued by the Department after careful consideration of all data and views submitted by individual members of the industry, trade associations, and from other sources. These standards were published in the Federal Register April 29, 1952, to become effective on May 30, 1952.

They are designed to serve as a convenient basis for sale in wholesale transactions and as a basis for the inspection of this commodity by the Federal inspection service.

Proposed Standards for Frozen Mixed Vegetables

THE U. S. Department of Agriculture has announced that it is considering the establishment of proposed U. S. standards for grades of frozen mixed vegetables, for which there are no U. S. standards. The proposed standards include recommendation for a mixture of three, four or five of the following vegetables: cut green or wax beans, lima beans, diced carrots, golden whole kernel corn, and early type or sweet type peas.

Under the proposed standards there would be no less than 20 percent of a single vegetable in a mixture of three vegetables. In a mixture of four vegetables, a single vegetable would constitute at least 8 percent of the weight and none of the other three vegetables would constitute more than 35 percent. In a mixture of five vegetables, a single vegetable would constitute at least 8 percent of the weight and none of the other four vegetables would constitute more than 30 percent. Small pieces of vegetables for garnishing purposes would be permitted.

The proposed standards provide for two grades—U. S. Grade A (or Fancy) and U. S. Grade B (or Extra Standard) — above Substandard. Scoring factors would include color, defects, and character. Some of the requirements would be based on the individual vegetables, as well as on the entire mixture, both before and after cooking.

Standards for Grades Of Frozen Apples

THE SECOND United States Standards for Grades of Frozen Applies have been issued. These standards have been issued by the Department after careful consideration of all data and views submitted by individual members of the industry, trade associations, and from other sources. These standards were published in the Federal Register May 3, 1952 (17 F.R. 4106) and became effective June 3, 1952.

They are designed to serve as a convenient basis for sale in wholesale transactions and as a basis for determining loan values.

Air Conditioning and Refrigerating Machinery Association Meets

A THREE-DAY meeting of the Air Conditioning and Refrigerating Machinery Association was held at Hot Springs, Va., May 21-23. This meeting of principal manufacturers of commercial and industrial air conditioning and refrigerating equipment was marked with optimism as to the near-term outlook for sales of the industry's products, particularly of the heavier types of equipment. Despite the current softness of the appliance market in general, it was felt that, because of the basic essentiality of refrigeration and air conditioning, the sales of the industry's output of smaller, "packaged" products would not be retarded. Demand was reported as continuing strong. All companies were benefiting from expanded and intensive sales programs.

George Sokolsky, newspaper columnist and radio commentator, addresses the annual luncheon of the Air Conditioning and Refrigerating Machinery Association. Left to right: M. M. Lawler, Worthington Corporation, first vice-president; A. P. Shanklin, Carrier Corp., retiring president; George Sokolsky; A. O. Vogel, Vilter Mfg. Co., newly-elected president; G. A. Heuser, Henry Vogt Machine Co., treasurer.

National Problems

George Sokolsky, newspaper columnist and radio commentator, was the principal speaker at the Association's Annual Luncheon. He stressed particuarly the domestic and foreign problems facing the United States. He emphasized the heavy responsibility of the American voter in this year's elections to provide able and patriotic legislators, regardless of party label, to lead the nation through these perilous times.

Dr. A. R. Oxenfeldt, consulting economist and marketing specialist, led discussion in a general conference on "Marketing Problems — Present and Future."

A. O. Vogel, vice-president, The Vilter Manufacturing Company, Milwaukee, Wis., was elected president. Other officers elected were M. M. Lawler of Worthington Corporation, Harrison, N. J., first vice-president A. J. DeFino, Fedders-Quigan, Corp., Buffalo, N. Y., second vice-president, and G. A. Heuser, Henry Vogt Machine Co., Louisville, Ky., treasurer.

Board of Directors: W. H. Aubrey, Frick Co. Inc.; H. B. Donley, General Electric; Mayard Ford, Parks-Cramer Co.; J. A. Gilbreath, Servel, Inc.; B. W. Hanson, Schaefer, Inc.; J. F. Knoff, Airtemp Division, Chrysler Corp.; S. E. Lauer, York Corp.; M. E. Mooney, Baker Refrigeration Corp.; A. B. Newton, Acme Industries, Inc.; A. P. Shanklin, Carrier Corp.; T. E. Smith, Westinghouse Electric Corp.; W. F. Switzer, Frigidaire Div. General Motors; G. E. Wallis, Creamery Package Mfg. Co.

Cleveland Warehousemen Elect Officers

AT THE annual meeting of the Cleveland Warehousemen's Association held May 21 at the Allerton Hotel, William Medler, Distribution Terminal Warehouse, was elected president for the coming year. A. M. Lownsbury was elected vice-president. The following directors were elected for a period of one year: R. C. Greeley, H. H. Lederer, D. Galvin. E. M. Nolan was appointed secretary-treasurer.

Book Review

MECHANICAL PROPERTIES OF METALS AT LOW TEMPERATURES—Published by United States Department of Commerce. Illustrated. 206 pages. Price $1.50. For sale by Superintendent of Documents, Washington, D. C.

A knowledge of the behavior of metals at low temperatures has grown in importance as the application of metals at low temperatures has increased with the steady growth of the refrigeration industry and the expanding demand for the liquefaction, transportation and storage of many gases. This volume presents some of the latest results of studies conducted both in industry and government. It is made up from papers presented at the symposium on the Influence of Low Temperatures on the Mechanical Properties of Metals, the second of a series of twelve symposia held by the National Bureau of Standards during its semi-centennial in 1951.

Los Angeles Chapter A.S.R.E.

WITH Edward Simons, national president of the American Society of Refrigerating Engineers, officiating as installation chairman, Los Angeles Chapter of the ASRE installed its new 1952-53 officers at the May 19 meeting in Rodger Young Auditorium, Los Angeles.

Elected to lead the chapter were the following: Chairman, Elmer A. Johnson of the California Consumers Corporation, who moved up from the first vice presidency to succeed in the top post Peter Askew of Thermal Products, Inc.

Installed as first vice-president was William J. Robinson of Hugh Robinson and Sons; 2nd vice-president, Eugene W. Smith of C & S Equipment Company, who had previously served the chapter as secretary; secretary, David D. Wile of Refrigeration Engineering, Inc.; and treasurer, William D. Paulson of General Electric Company.

In recognition of his unselfish service to the chapter during the year just closed, retiring president Askew was presented with a framed scroll of thanks.

The principal talk was presented by National President Simons on "The New Technique of In-Place Wall Testing of Insulation." As a consulting engineer of national repute and a recognized authority in the field of refrigeration, Mr. Simons' presentation on the new technique of testing the insulating values of material after it has been already installed proved highly informative.

News Notes N.A.P.R.E. Rio Grande Valley

(Continued from page 49)

President Doneis expressed regret over his previous neglect to thank outgoing officers of the chapter for the good work they did in office during the past year and officially expressed the chapter's appreciation for the services rendered by these faithful officers. In discussion of the valuable services of Instructor John Muller, it was unanimously agreed that the chapter shall double his salary in that capacity and raise his rank by conferring upon him the honorary title of full Professor.

During the Question Period the question of the relative merits of steel and wrought iron pipe in corrosive locations was brought up. One member reported having an ammonia discharge header on an atmospheric condenser which rusted and pitted badly due to use of zeolite softened water. He reported that the water falling as a mist on the hot pipe evaporates away and leaves behind a deposit of dissolved solids which attacks the pipe and makes for short life of the header.

Mr. O'Neill, district chief engineer of the Ice Division of C.P.&L. substantiated the general concensus of opinion that wrought iron pipe is definitely practical for such an application and that it would last from four to six times as long in similar service as compared with black iron pipe. It was further suggested that such pipe can be coated with a bituminous or asphaltic coating, then wrapped with heavy tar paper, and coated again on the outside. This was particularly recommended also for other ammonia piping exposed to difficult conditions, where the pipe is not heated by discharge gas.

Prof. Muller then proceeded with a discussion of merits of various refrigerants, their peculiarities and differences of characteristics and operation. He also gave a detailed picture of the purpose, construction and operation of expansion valves of various types.

Canadian Magazines Play Up Ice Publicity

HEADED "Here's a brand new idea that may solve one of your problems," the Ontario Retailers, the official trade magazine of the Retail Merchants Association of Canada (Ont.) Inc., has an article in its March issue promoting the advantages of displaying meat on ice. It relates a study of the Department of Animal Husbandry and the University of California, of identical cuts of meat placed in two display cases,—one mechanically refrigerated only, and the other mechanically refrigerated plus crushed ice display.

Tables demonstrate the effects of high and low humidity. For instance, the report shows that after eleven hours, un-iced ground beef was dry, dark and crumbling, while the beef on ice was still moist.

Convention Calendar

NATIONAL FOOD DISTRIBUTORS ASSOCIATION

August 11-14, 1952
Sherman Hotel, Chicago, Ill.
EMMET MARTIN, Secretary

CANADIAN ASSOCIATION OF ICE INDUSTRIES

October 21-22, 1952
Chantecler Hotel, Ste. Adele, Que.
MRS. MILDRED CROFT, Secretary

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS

November 12-14, 1952
Adolphus Hotel, Dallas, Tex.
A. R. CARLSON, President

Association Directory

AMERICAN INSTITUTE OF REFRIGERATION
H. T. McDermott, Gen. Secretary, 433 N. Waller, Chicago 44, Ill.

NATIONAL ASSOCIATION OF ICE INDUSTRIES
Guy W. Jacobs, Secy., 1706 L St., N. W., Washington 6, D. C.

NATIONAL ASSOCIATION OF REFRIGERATED WAREHOUSES
Wm. Dalton, Exec. Vice-Pres. Tower Bldg., Washington 5, D. C.

NATIONAL ASSOCIATION OF PRACTICAL REFRIGERATING ENGINEERS
435 N. Waller Ave., Chicago 44, Ill.

CALIFORNIA ASSOCIATION OF ICE INDUSTRIES
Jack L. Dawson, Secretary
461 Market St., San Francisco, Calif.

CANADIAN ASSOCIATION OF ICE INDUSTRIES
Mrs. Mildred E. Croft, Secretary
317 Eglinton Ave., Toronto, Canada

DELTA STATES ICE ASSOCIATION
R. N. Milling, Secretary
Ouachita Bank Bldg., Monroe, La.

EASTERN STATES ICE ASSOCIATION
R. H. Wilson, Secretary-treasurer
Delavan Ave. & Spruce St., Philadelphia, Pa.

FLORIDA ICE ASSOCIATION
Muriel Washburn, Secretary
1926 Silver St., Jacksonville, Fla.

GREAT LAKES CHAPTER, N.A.R.W.
Harry Foster, chairman
Cincinnati Terminal Warehouses, Inc.
Cincinnati, Ohio

ILLINOIS ASSOCIATION OF ICE INDUSTRIES
W. D. Wright, Secretary
Clinton Pure Ice Co., Clinton, Ill.

INDIANA ASSOCIATION OF ICE INDUSTRIES
Robert W. Walton, Secretary
Board of Trade Bldg., Indianapolis, Ind.

KANSAS ASSOCIATION OF ICE INDUSTRIES
Matt Scherer, Secretary
McPherson Ice Company,
McPherson, Kansas

KENTUCKY ICE MANUFACTURERS ASSOCIATION
R. T. King, Secretary
131 W. Main St., Louisville, Ky.

MICHIGAN ICE INDUSTRIES ASSOCIATION
Edward W. Jackson, Secretary
131 E. Kalamazoo Ave., Kalamazoo, Mich.

MISSOURI VALLEY CHAPTER, N.A.R.W.
H. A. Steinmeyer, chairman
Booth Cold Storage Co., St. Louis, Mo.

MISSOURI VALLEY ICE MANUFACTURERS' ASSN.
V. A. Esphorst, Secretary
3820 Washington St., St. Louis, Mo.

MOUNTAIN STATES ASS'N OF ICE INDUSTRIES
J. R. Espy, Secretary
Espy Ice Co., 2101-31st St., Denver 5, Colo.

NEBRASKA ASSOCIATION OF ICE INDUSTRIES
Frank Vogelsang, Secretary
W. T. Good Ice Co., Lincoln, Nebr.

NEW ENGLAND ICE ASSOCIATION
Raymond Wilber, Secretary
83 Winter St., Providence, R. I.

NEW JERSEY STATE ASSN., N.A.R.W.
Leo I. Fisher, president
Harborside Warehouse Co. Inc.
Jersey City, N. J.

NEW YORK STATE ASS'N REF. WAREHOUSES
Garth A. Shoemaker, president
Hygeia Refrigerating Co., Elmira, N. Y.

NORTH ATLANTIC CHAPTER, N.A.R.W.
Jerry Johnson, Chairman
Terminal Refrigerating & Warehousing Corp.
Washington, D. C.

NORTH CAROLINA ICE ASSOCIATION
Lewis H. Powell, Secretary
Capital Ice & Coal Co., Raleigh, N. C.

NORTH PACIFIC CHAPTER, N.A.R.W.
E. F. Swanberg, chairman
Diamond Ice & Storage Co.,
Seattle, Wash.

NORTHWEST ASSOCIATION OF ICE INDUSTRIES
L. F. Marsh, Secretary
1539 N. E. 37th Ave., Portland, Ore.

OHIO ASSOCIATION OF ICE INDUSTRIES
Elizabeth Shannon, Acting Secy.-Treas.
The Steubenville Ice Co., Steubenville, O.

OKLAHOMA ASSOCIATION OF ICE INDUSTRIES
Harry T. Hudson, Executive Secretary
525 Cravens Building 7, Oklahoma City, Okla

PACIFIC STATES COLD STORAGE WAREHOUSEMEN'S ASSOCIATION
Jack L. Dawson, Secretary
461 Market St., San Francisco, Calif.

SOUTH CAROLINA ICE MANUFACTURERS ASS'N
Geo. L. English, Secretary
P. O. Box 603, Columbia, S. C.

SOUTH PACIFIC CHAPTER, N.A.R.W.
M. W. Young, Chairman
National Ice & Cold Storage Co.,
San Francisco, Calif.

SOUTHERN ICE EXCHANGE
Richard W. Florrid, Secretary
113½ Forsyth St. N. W., Atlanta, Ga.

SOUTHEASTERN CHAPTER, N.A.R.W.
W. B. Haggerty, Chairman
Tampa Cold Storage & Warehouse Corp.
Tampa, Fla.

SOUTHWESTERN CHAPTER, N.A.R.W.
C. P. Metcalf, chairman
Southwestern Ice & Cold Storage Co.,
Austin, Tex.

SOUTHWESTERN ICE MANUFACTURERS ASS'N
P. A. Weatherred, Secy. Counsel,
Mercantile Bank Bldg., Dallas, Tex.

TENNESSEE ICE MANUFACTURERS ASSOCIATION
W. E. Harlan, Secretary
Mt. Pleasant Ice Co., Mt. Pleasant, Tenn.

TRI-STATE ASSOCIATION OF ICE INDUSTRIES
L. R. Girton, Secretary
260 Boyce-Greeley Bldg., Sioux Falls, S. D.

VIRGINIA ICE MANUFACTURERS ASSOCIATION
H. H. Snyder, Secretary
Alexandria, Va.

WEST VIRGINIA ASSOCIATION OF ICE INDUSTRIES
E. Dana Smith, Secretary
Diamond Ice & Coal Co., Charleston, W. Va.

WISCONSIN ASSOCIATION OF ICE INDUSTRIES
Paul F. Hoff, Secretary
1300 East Locust St., Milwaukee, Wis.

New Plants and Improvements

Arizona

Phoenix, Ariz.—The Crystal Ice & Cold Storage Co. will build a new lettuce packing plant to cost about $200,000.

Canada

Calgary, Alberta, Canada — The Alberta Ice Company, Ltd., founded in 1911, has constructed a modern plant for manufacturing ice. The plant is located on Riverside Blvd. two blocks east of the 4th Street East bridge. It is recognized as the largest ice manufacturing plant in Canada, covering an area of 150 x 200 feet.

Michigan

Calumet, Mich. — The Asselin Creamery has opened a storage and deep freeze plant at 331 Sixth Street. Opening of the auxiliary station here will enable the company to better serve the public in Houghton and Keweenaw counties.

Pontiac, Mich. — Another freezing compartment for Oakland County's storage plant has been approved by Oakland County Board of Supervisors.

New Mexico

Grants, N. Mex.—The Grants Ice and Development Co. is building a $250,000 plant here to serve the vegetable growers and shippers of the Bluewater Valley who require approximately 30,000 tons of ice annually for car-icing shipments from Grants. The plant will have an output of 200 tons a day.

Washington

Seattle, Wash. — Well-equipped with adequate machinery and facilities, the Snowflake Ice Cream Company has been set up at 8343 15th Ave. N. W. Seattle by Mr. and Mrs. Earl Nicholson.

Fires and Accidents

Angola, Ind.—Harold Hufnagle and Virgil Ward were critically injured when a compressor exploded at the Pet Milk Plant here. The accident occurred as the men were engaged in making repairs to the compressor.

Medway, Mass.—Fire did $60,000 worth of damage at the Golden Meadow Ice Cream Co. plant recently. The structure was destroyed and about 10,000 gallons of ice cream was lost. The fire started in a steam generator used to sensitize the ice cream making process, just as the workers were about to close the plant. They attempted to control the fire with extinguishers, but it gained headway rapidly, spread to ammonia tanks, and caused several small explosions.

St. Louis, Mo.—Damage estimated at $2000 was caused by a fire which swept through the upper floor of an unoccupied two-story building at 3160 Arkansas Ave. The building was formerly used as an ice plant by City Products Corp.

Sales and Reorganizations

Flat River, Mo.—The Pure Ice Co. Cape Girardeau has leased the Flat River Ice & Cold Storage Company here with option to buy. The firm has been renamed the Lead Belt Ice & Fuel Co. Neal Gilett of St. Louis formerly of Fredericktown, will manage the new business. Coin-operated vendors will be installed.

Great Barrington, Mass. — The Community Frozen Food plant on Railroad Street, operated the past six years by Solomon Nager, has been sold to C. Douglas Baird of this city. The local plant is one of the largest of its kind in Western Massachusetts. Its business consists of processing beef, freezing services, bulk storage, etc.

Chicago, Ill.—The seven midwestern and southeastern ice and cold storage plants of the Railways Ice Company have been purchased by The Railways Ice & Service Co. A Southeastern Public Service Company subsidiary. The plants are devoted mainly to servicing railroads.

New Incorporation

Gulfport, Miss.—Ice Manufacturing Corporation has been granted charter of incorporation. Capital stock was listed at $6,000.

Mamaroneck, N. Y.—The Saxony Ice Co. has been incorporated to manufacture and distribute ice, refrigerators, and air conditioning machines. Capital stock, 200 shares of no par value.

DEATHS

William Robert Wood

THE death of William Robert Wood, builder of the Peoples Ice & Cold Storage Co., Omaha, Nebr., occurred May 22. He was 78. He had been ill several months.

Mr. Wood came to Omaha in 1901 and in 1905 entered the cold storage business. His interest in the firm was sold several years ago and he retired in 1947.

He was a second cousin of James McNeill Whistler, painter of the famous "Portrait of My Mother." He also was the great-grandson of Capt. John Whistler, who established Fort Dearborn as a military outpost on the Chicago River in 1803.

Survivors include his widow, Fannie Howland Wood; sons, William W., Omaha, and Edward, Eugene, Ore., and three grandchildren.

WILLIAM F. FORD, route superintendent of the American Service Company, Columbus, Ga., died recently, following an illness of two weeks. Mr. Ford's son, James W. Ford is manager of the American Service Company in Columbus, and immediate past president of the Georgia Ice Manufacturers' Association. He had been a resident of Columbus for the last forty years.

Samuel Freer

THE death of Samuel Freer, well known throughout the ice industry as secretary of the Eastern States Ice Association and manager of the Philadelphia Ice Sales Co., occurred May 10. He was ill in his home for several weeks but was taken to the hospital the day before his death. He had resigned his position as secretary of the association the latter part of last December.

Samuel Freer

Mr. Freer had been in the ice business all his life. He started as a weighmaster in the City of Brooklyn in 1898 for John H. Bahrenburg who sold natural ice to peddlers, shipped from the Pocono Mountains and North Jersey. In 1890 the Mountain Ice Co. bought the company and Mr. Freer continued as depot manager. In 1904 he was promoted to office manager of the Philadelphia office which was closed in 1916 and he was transferred to the main office in Hoboken.

In 1917 he became manager of the newly formed Ice Publicity Association of Philadelphia and vicinity and in 1939, twenty-two years later, he took the job of manager and later manager of The Philadelphia Ice Sales Co. which he continued to hold until his death. During this time he attended the organization meeting of the National Association of Ice Industries and also assisted in forming local ice associations in the cities of Baltimore, Pittsburgh and Buffalo.

In April 1933 a joint meeting of the Eastern Ice Association and the Middle Atlantic States Ice Association was held in the City of New York at which meeting the two associations consolidated and formed the Eastern States Ice Association, of which Mr. Freer was elected general secretary and treasurer.

He is survived by his widow; Mrs. Bertha M. Freer and a daughter.

Hayes T. Cory

THE death of Hayes T. Cory, president of Bay Engineering Company, San Francisco, and formerly vice-president and one of the organizers of Baker Engineering Corporation, Los Angeles, occurred May 9, at the age of 46.

Mr. Cory is survived by the widow, Mrs. Elizabeth W. Cory of Arcadia, Calif., one son and one daughter, and a sister, Mrs. Wellwood E. Beall of Seattle, Wash. He was a native Californian, having been born in Oakland, Calif., July 7, 1906, moving to Los Angeles about 1912.

He was educated in the Los Angeles public schools, was a graduate of Hollywood High School, and of the University of California at Berkeley, class of 1929. Following graduation, he spent several years in various types of employment, among them being Paramount Pictures in Hollywood, as well as several phases of engineering elsewhere.

In 1935 he joined the engineering staff of Baker Ice Machine Company in Los Angeles, later being transferred to Fresno, Calif., where he served several years as the firm's supervisor of activities in the San Joaquin Valley, designing and installing refrigeration and air conditioning installations.

In 1924 he took leave of absence from Baker Ice Machine Company and spent some years with the Boeing Aircraft Company in Seattle, Wash., working on the design and testing of heating and supercharging systems for the B-17 and B-29 airplanes. He returned to the Baker Company in 1943 as director of San Francisco activities until 1945, when he was transferred to Los Angeles as chief engineer for the California district.

Mr. Cory was an outstanding refrigeration and air conditioning engineer. He was an active member of the National Association of Practical Refrigeration Engineers, having held various offices in Los Angeles Chapter, NAPRE. He was also an active member of the American Society of Refrigerating Engineers at the time of his death, being affiliated with the Los Angeles section of that organization. He was a member of the board of directors of the Refrigeration and Air Conditioning Association of Southern California, in which he had taken an active part for many years on both technical and labor relation matters. He had assisted in the drafting of the present Los Angeles City Refrigeration Code, among other activities for the association.

Henry J. Christiansen

THE death of Henry J. Christiansen, supervisor of mailing and shipping for the National Association of Ice Industries, occurred Tuesday, May 27, at the Presbyterian Hospital in Chicago. He was 59.

In ill health for the past year Mr. Christiansen was on leave of absence for treatment. An operation took place several months ago. His passing was a shock to fellow employees at the Washington office of NAII and his sister, Esther C. Christiansen, NAII fiscal assistant secretary.

Up to a few days before his death, Henry, as he was called by friends and associates, was believed to be recovering and was at home. A relapse suffered the previous Saturday necessitated his return to the hospital.

In terms of seniority, he was the second oldest employee on the Association staff, having served for 23 years. A vital cog in the smooth functioning of the Washington office, Henry was highly regarded for his dependable and efficient handling of all kinds of correnspondence and material mailed or shipped. In view of his years of service one can appreciate that he supervised the distribution of millions of helpful aids—from postcards to display cases—to NAII members.

Henry is a veteran of World War I who saw military service overseas. Later he became a member of the police force of Chicago. It was in this capacity that he first served the Chicago office of NAII as part time mail and shipping clerk. As the Association workload increased, he finally decided that handling mail, etc., was more interesting than "walking a beat." The Chicago police force's loss was the Iceman's gain, for his ability to get the job done would have served him well as a policeman.

A jack of all trades, Henry could always be relied upon to lend a helping hand regardless of the task. His willingness, his good-natured smile, and friendly manner will long be remembered by his friends and associates.

Although in recent years he had been living in Washington, D. C., he retained permanent residence in Oak Park, Ill. Mr. Christiansen is survived by his widow, Anna B., his sister, Esther C., and a brother Charles of Chicago.

EDGAR B. JEWETT II, president of the Jewett Refrigerator Company, Inc., Buffalo, N. Y., and probably the foremost developer in this country of a modern system of refrigeration for hotels, died May 30 at his Buffalo home. He and his family have been in the refrigeration business for more than a century—from the porcelain lined ice boxes of the 1800s to major installations in large buildings today.

John H. Bramstedt

THE death of John H. Bramstedt, Sr., who founded the J. H. Bramstedt & Sons ice business in St. Louis County, Mo., occured May 9. He was 77, and had been in the ice business since 1913. Mr. Bramstedt started an ice business at 8501 St. Charles road, later expanding it to include fuel, building material and feed. Operation of the business had been taken over by his sons and daughter for the past several years.

One of the organizers of the St. John's Community Bank, Mr. Bramstedt was an original member of the board of directors. He was also on the board of the community fire department, another organization which he helped found. And the St. John's Community Business Men's Association was another organization which Mr. Bramstedt took an interest in creating. He was active with the group until it became dormant about three years ago.

Surviving are his widow, Louise, sons, John, Arthur and Charles and a daughter, Mrs. Elvira Ruehmann.

Charles G. Spencer

THE death of Charles G. Spencer, field sales manager of the Henry Bower Chemical Mfg. Company, occurred in Philadelphia Sunday, May 18, after a short illness. Mr. Spencer had been sales representative of the Bower Company in the New England and Southern as well as the metropolitan Philadelphia and New York territories at various times over his twenty-seven years of service. He was well known in the refrigeration and metal heat treating industries which he had served for many years.

Earl Smith Mulley

THE death of Earl Smith Mulley, president of the American Service Co., Kansas City, Mo., occurred unexpectedly June 4 after suffering a heart attack. He was 68.

Mr. Mulley had been with the ice manufacturing firm about twenty-five years. He previously had served as secretary-treasurer and executive vice-president. He was elected president last March. Mr. Mulley was born at Deerfield, Ill., and had lived here about twenty-five years.

He leaves his widow, Mrs. Esther Mulley, two daughters, Mrs. William Brent, Jr., Lawrence, Kans.; and Mrs. Arvid Edwards, Platte City, a son, Dr. H. J. Mulley, New Orleans.

Clarence N. Ruh, Park Ridge, Ill., former owner of the C and N Artificial Ice Co., Chicago, died May 11. Mr. Ruh who was 65, retired more than 20 years ago.

ESKIMO ICE CRUSHERS

Mfg. by Matthiesen Ice Machine Co.
Especially for Ballard Sales Company.

250-P

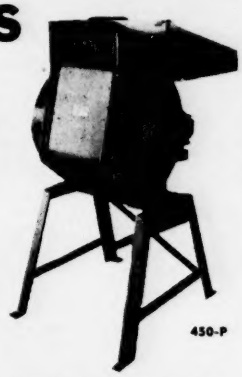
The crusher you have been waiting for . . . built entirely of steel . . . no casting that can break or wear. It is designed to last a lifetime with a minimum of care.

ALL OF THE ESKIMO CRUSHERS ARE EQUIPPED WITH SELF-ALIGNING BALL BEARINGS ON THE DRUM SHAFT AND NEEDLE ROLLER BEARINGS ON THE IDLER SHAFT.

MODEL 450-P (shown at right)

50-lb. capacity hopper, drum diameter 14" drum length 14", hopper opening 14¼"x14" 5 point size adjustment, triple "V" belt and #70 chain drive, height of crusher to lead chute—23", height of standard stand 24", overall height of crusher overall 56". 1½ H.P. 3 phase motor, crushing time 350-400 lbs. per minute. Height of lift of ice to the load chute with a 24" standard stand is: height of crusher to load chute plus height of stand which is 24" plus 23" or 47" lift. Shipping wt. 600 lbs.

Price F.O.B.—$470.00



450-P

MODEL 250-P (left)

This new Model 250-P will take a 50 lb. square block. We have incorporated our fine features of the smaller models and our large model, and in addition have put in improvements to make this the finest crusher ever offered.

Price—with ¾ H.P. Motor—$304.50—Zinc Plated

Model 200-P (25-lb. Crusher) Zinc Plated. Price F.O.B. $246.00 (including motor).

Model 100-PC 12½-lb. Direct Drive Zinc Plated Crusher. Price F.O.B. $192.00 (including motor). Price slightly less without zinc plating.

Write for Complete Information

TRUCK TYPE CRUSHERS available. Specifications and prices upon request.

Drive Used on Models 200-P and 250-P

This view shows the NEW #40 Roller Chain Drive on the drum shaft and the V-Belt Drive from the motor to the Reduction Drive. This insures no slippage and still maintains a safety feature and protection for the crusher. Belt and chain are adjustable to compensate for wear.

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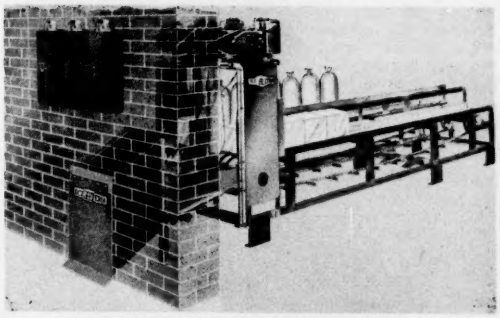
Today, labor costs eat into your profits. The new Perfection Ice-A-Teria, fully automatic vending machine, actually pays for itself from savings on labor. More than that, however, you can offer your customers 24-hour service. The Perfection Ice-A-Teria is adaptable to fill your needs. Write, wire or phone today for complete information.



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What's New

MACHINERY
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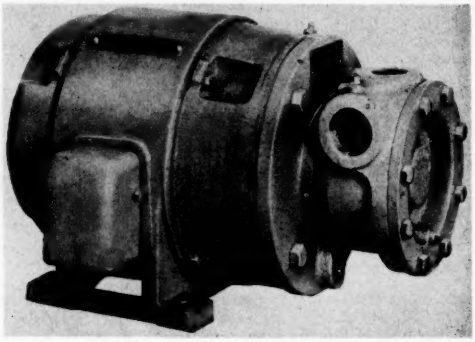
New Turbine Pumps

FOR pumping hot and cold, clear and vaporous liquid, in moderate capacities, against medium or high heads, Peerless Pump Division, Food Machinery and Chemical Corp. has recently introduced a line of self-priming and standard design turbine vane type pumps. The designation type TVE is given to the line of pumps close-coupled to face mount electric motors; the designation Type TVB is given to the line of flexible-coupled electric drive pumps. Pumps in both lines are available with or without the self-priming device.



Peerless type TVE standard turbine vane type pump.

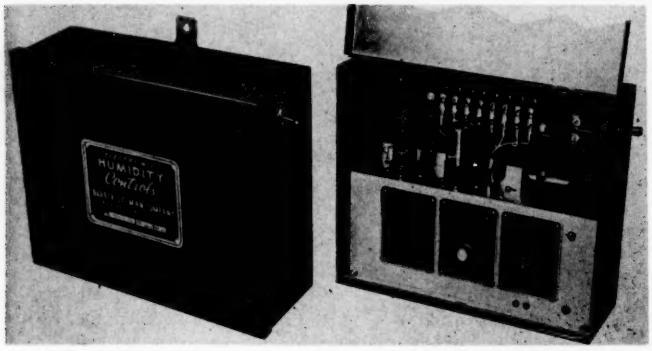
Capacity range at 3500 rpm is up to 58 gpm; at 1750 rpm, up to 56 gpm. Head range at 3500 rpm is up to 800 feet; at 1750 rpm, up to 300 feet. Motor sizes up to 20 hp are available at 3450 rpm and up to 7½ hp at 1750 rpm.

Complete descriptions and illustrations of these turbine vane type pumps together with head-capacity selection charts, sectional views and elevation drawings and dimensions are included in a new bulletin No. B-2205.

New Electronic Humidity Control

TWO-POSITION or proportioning, humidifying or dehumidifying, for process or comfort control, the new Barber-Colman Electronic Humidity Control features super-sensitive, instant response with plug-in element, wide range, and simple adjustments. Moisture-sensitive element changes resistance instantly with minute changes in relative humidity.

In spaces supplied by a central fan, the sensing element is mounted either in the duct or the conditioned space, remote from the amplifier and adjustments. For controlling the relative humidity in spaces not completely air conditioned, the highly sensitive aspirating type control is available with all operating adjustment mechanisms mounted in a cabinet.



The new Barber-Colman Electronic Humidity Control

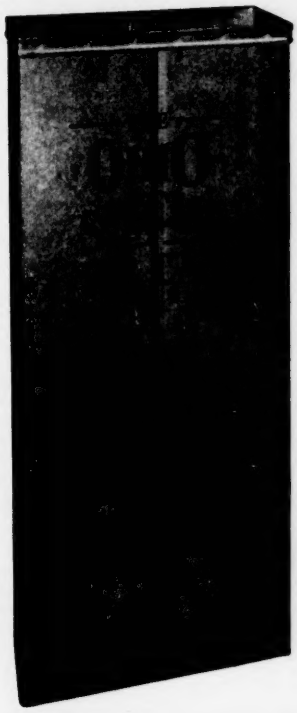
Roof Cooler

WHETHER it is ice making, ice storing, food freezing, or cold storage, unwanted heat is involved; much of it enters through the roof, especially during hours of intense sunshine because this causes roofs to get very hot. Unfortunately the solar heat load is biggest when refrigeration equipment is taxed highest by the demands of business. Cooling roofs directly by evaporation of water is very effective help and it costs little if suitable equipment is used.

Roof Cooler Installed

The picture shows a roof cooler that can serve more than 3000 sq. ft. of roof area. It is assembled on a standard brass coupling for attaching to a water pipe and consists of a nozzle and a water wheel. A jet of water shoots at the best ballistic angle over the space to be cooled. It also sets the wheel in motion which in turn rotates the cooler to make it serve a large area. It also divides the water for intimate evaporative contact with the air before it acts on the roof temperature.

Where horizontal runs of tubing are involved, the cooler slides on its base plate to allow free expansion and construction.



Welded Cans
Integral Tube Cans
Arctic Pownall Cans
Can Baskets
Condenser Trough

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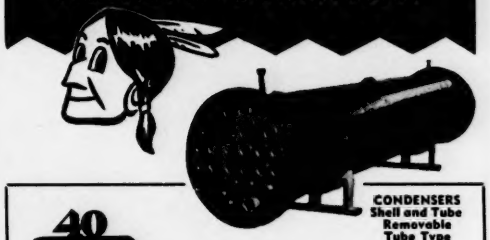
Industrial Trucks and Trailers

THE OHIO GALVANIZING & MFG. CO.
NILES Established 1902 OHIO

HOWE

PUTS THE INDIAN SIGN ON HIGH COSTS IN REFRIGERATION



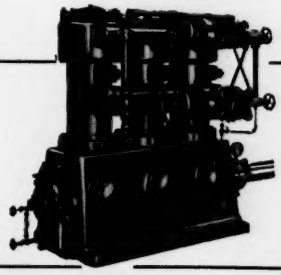
CONDENSERS
Shell and Tube
Removable
Tube Type

40 HOWE YEARS

It's the final results that count! Your products, to preserve their best qualities, MUST be controlled constantly at the precise temperature and humidity. Constant control is also vital in storage cooling and freezing. This means you MUST have the best reliable refrigeration equipment; the kind that will do the job without high original cost, expensive maintenance or mechanical failure. IT MUST BE RIGHT!

Get the benefits of Howe's 40 years of practical, field-proved refrigeration knowledge, and their ruggedly built, trouble-free equipment. You save money, space, labor, time—with Howe individually engineered installations, regardless of size. Write for free booklet, or without obligation consult Howe engineers on your refrigeration problems!

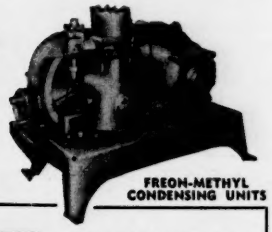
A few territories still open . . . write for details about the HOWE profit-plan for new distributors.



STANDARD AMMONIA COMPRESSORS TO 150 T

UNIT COOLERS

FIN COILS



FREON-METHYL CONDENSING UNITS

HOWE ICE MACHINE CO.
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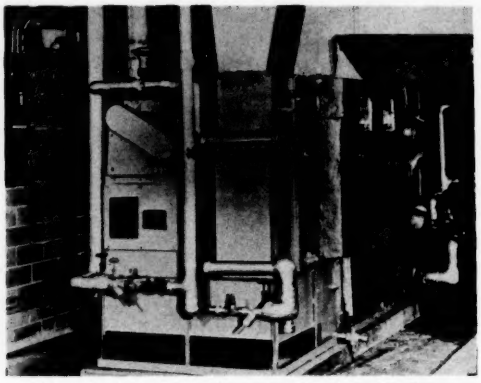
CABLE ADDRESS • HIMCO, CHICAGO
Distributors in Principal Cities

New Package Unit For Humidity Conditioning

TODAY'S DEMAND for continuous and increased production which involves use of air at sub-freezing temperatures has been met by the Kathabar Division of Surface Combustion Corporation, Toledo, Ohio, with a newly-designed low-temperature package unit for humidity conditioning. This new equipment provides for continuous delivery of air at temperatures ranging from 32 F to as low as —100 F. The unit is a modification of the conventional Kathabar package unit for obtaining low absolute humidities.



New Kathabar Unit for providing low absolute humidities.

The confectionery, pharmaceutical, military gun and jet powder, aircraft, laminated safety glass and other industries have required air conditioning equipment which could deliver air continuously at below-freezing dewpoints. Previously, air at low temperatures could be supplied for only short periods of time through use of refrigeration cooling equipment. However, cooling coils through which the refrigerant flows become coated with ice, caused by condensed moisture from air as the air is cooled. This ice-coating acts as a most effective insulator to the refrigeration process and causes a throttling action on air flow. Frequent periodic shutdowns for defrosting result. It has been necessary to eliminate moisture from air, i.e., lower the dewpoint below the air temperature, to allow for continuous operation of air conditioning equipment in the sub-freezing range.

The new Kathabar low temperature package unit now provides for an increased air moisture-absorbing capacity through utilization of refrigerants in its cooling coils. Such refrigerants include calcium chloride brine, methanol, ammonia, Freon, and chilled water. If desired, dewpoints considerably below the air temperature can be obtained. Refrigeration equipment is enabled to operate continuously at maximum efficiency without shutdowns for defrosting.

Air capacities for these new Kathabar units range from 1350 cfm to 5000 cfm, capable of removing 30 to 290 pounds of water per hour from air. Conventional utilities are required. The unit is all on one base, measuring for the largest size approximately 48 in. x 108 in. x 66 in.

Kathabar equipment operates with no "carry-over" of the dehumidifying agent in the delivered air stream, thereby eliminating possibility of product contamination. The absorbent solution forms a protective coating on all coils and other surfaces with which it comes in contact, preventing corrosion.

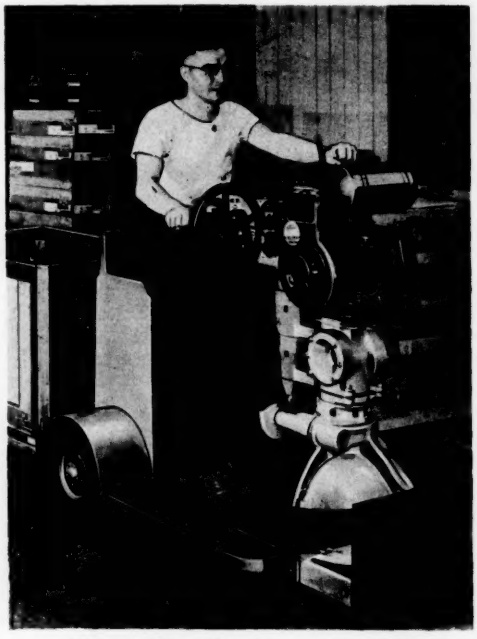
New Tractor Model for Load Limit Problems

A NEW tractor model has been added to the Truck-Man line of industrial trucks. Designed the "Truc-Tor" Model DR, it is capable of hauling cargo trucks of up to 13 times its own weight (990 lbs.) on dry, level concrete, according to the manufacturers, Truck Man Division of The Knickerbocker Company. The heavy duty air-cooled engine of 5.8 hp is said to operate a full eight hour shift on approximately one gallon of gasoline.

Designed as an answer to load limit problems on elevators, floors, docks and dock-boards, this tractor is equipped with heavy duty industrial pneumatic tires all around, assuring an easy ride and reducing damage. The power turret revolves 360 degrees as in all Truck-Man models, giving it extreme maneuverability. The company also manufactures the Model D Skid Lift, Model DF Pallet Toter, both with hydraulic lifts, and the Model DT Platform Utility.

This compact tractor is designed to meet the needs of warehousemen and others who are in the market for a light-weight truck selling in the $1,000 bracket.

An eight-page catalog describes the standard line as well as recent special designs. Further information may obtained by writing the Truck-Man Division Knickerbocker Company, Jackson, Mich.



The new Truc-Tor Tractor Model DR

ICE SUPPLIES

- PAPER BAGS
- CANVAS BAGS
- ICE PICKS
- ICE TONGS
- TANK SUPPLIES

EQUIPMENT

- SHAVERS
- CRUSHERS*
- CRUSHER-SLINGERS
- SCORERS

Stainless Steel Crusher Housing (Optional)

"Complete line of Tools and Supplies for the Ice Industry"

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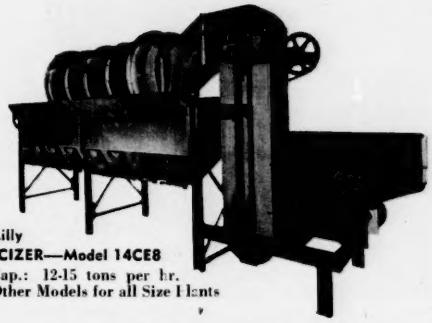
MORE PROFIT IN ICE

–When Sized by a Lilly ICIZER



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ICIZER—Model 14CE8
Cap.: 12-15 tons per hr.
Other Models for all Size Plants

Ice—*properly sized*—brings premium prices—more dollar profit. It brings additional sales and profits the year 'round. The new engineering features in Lilly ICIZERS and CRUSHERS—*Stainless Steel Breaker Housing (Optional), reduced drum speed, etc.*,—give you even more economical and better controlled production.

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Lilly ICIZERS and CRUSHERS

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860 Maple Street
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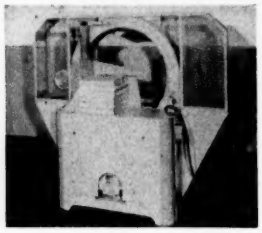
Complete data, prices and useful information. Free on request.

ARMSTRONG Forged Steel PURGER

New Machines for Automatic Packaging

DESIGNED for automatic, volume packaging, two new machines have been introduced by The Guide Company, Canfield, Ohio. Model G.W. applies a complete wrap of tape

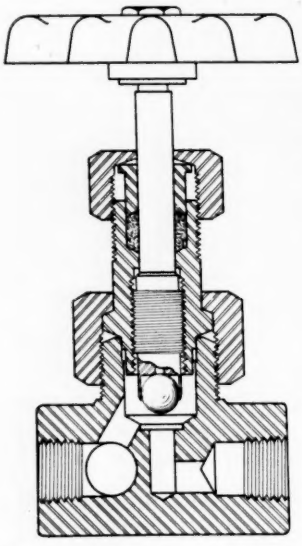


Model G.W. Packaging Machine.

around cartons, bundles of cartons, or other similar items. It is a self-contained unit operated by one control button and one man. Model C.G. is particularly adaptable for bundling metal stock, pipe, lumber and similar elongated material. A four-page brochure contains complete description and specifications.

New Ball Valve Provides Tight Seating

A NEW ¼-inch Ball Valve of unique construction, recommended for working pressures up to 3000 psi, is announced by The Foxboro Co., Foxboro, Mass., makers of precision instruments for industrial process measurement and control.



Cross section diagram of the Foxboro ¼ inch Ball Valve, Globe type, two connections.

It is claimed that tight, positive shutoff is provided by a stainless steel ball which closes into a machined, conical seat. The ball, retained at the end of the stem, is free-rolling so that every closing brings a new surface into contact with the valve seat. Alignment of ball to seat is accurately piloted by a forged steel, union-type bonnet, fitting tightly to the body and assuring a correct valve closure.

The long-stroke stem and the packing gland are made of stainless steel for durability and resistance to corrosion. The packing is a preformed, graphited asbestos with a plastic binder and can easily be replaced without shutting off the line pressure or interrupting the process. Straight-through and angle types are available with two and four connections, meeting the wide range of valve-design requirements found in general industrial use.

New Control Device On Electric Fork Truck

THE new SpaceMaster electric fork truck line has been announced at the Lewis-Shepard Watertown, Mass. plant. Among the many engineering and operational features incorporated in the new design is the new master controller. Speed, direction and braking are accomplished with the one master control lever.

New Lewis-Shepard Electric Fork Truck

The operator has a choice of four speeds forward or reverse and with the incorporation of magnetic controls he can throw the master control lever into full speed forward and get a smooth, automatically timed acceleration through each speed. It is not necessary to stop the lever at each speed stop. However, any one of the speeds can be selected if desired and the truck can be run all day in any one of the speeds.

Furthermore, the operator can go from full (or any) speed forward to full (or any) speed reverse with one quick flick of the lever. Deceleration forward through neutral and into acceleration reverse are all controlled by magnetic timing.

Perhaps the most interesting feature is dynamic braking which means that the operator can decelerate and stop his truck without the use of his mechanical brake. Dynamic braking is accomplished via the master control lever in the palm of the driver's hand, eliminating the foot-brake operation.

New Carrier Ice Maker

THE new Carrier Cub automatic ice maker will make 200 pounds of cubes or crushed ice daily. Carrier officials said the new machine was built to specifications set up by interviews with operators of hotels, restaurants, hospitals, taverns, supermarkets, meat markets, drug store fountains and other locations where ice is used.

New carrier cub automatic ice maker.

The new machine, like the Carrier 450-pound Model, may be obtained in a combination model with a factory built-in crusher for production of either cubes or crushed ice at the turn of a knob. Models of this type are supplied with a divided bin, and the machine automatically deposits cubes in one section and crushed ice in the other.

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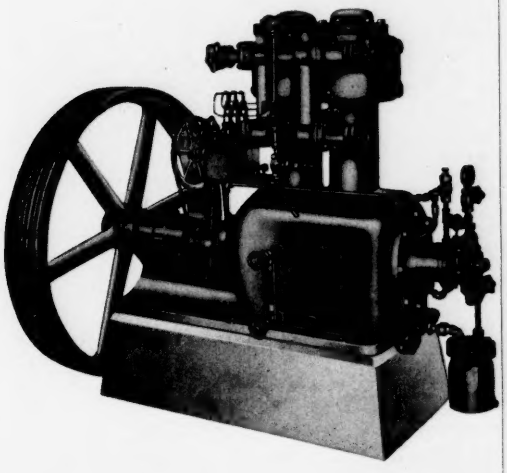
. . . . . a global fame built by more than half-a-century of engineering progress and constantly increasing production facilities. Check over your requirements now — write us for prices and complete information on Sterling ammonia compressors, condensors, receivers, ice tanks, surge drums and related products. We will be happy to furnish you with the name of your nearest STERLING distributor!



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SPRINGFIELD . . . MISSOURI.

Use Calcium Chloride for BRINE MAKING?

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- **Get Immediate Delivery**—available from dealers and warehouse stocks in principal cities.
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SOLVAY Calcium Chloride

MAIL COUPON for Free Brine Maintenance Chart . . . prices and location of nearest stock . . . and information on the preparation, strengthening and maintenance of Calcium Chloride Refrigeration Brine.

THE SOLVAY PROCESS DIVISION, Allied Chemical & Dye Corp.
61 Broadway, New York 6, N. Y.

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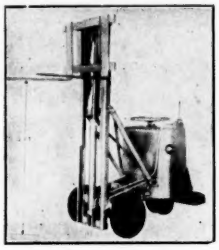
MANUFACTURERS' NEWS

Fork Lift Attachment For Light Loads

A POWER-DRIVEN fork lift attachment has been developed by the Kwik-Mix subsidiary of The Koehring Co., Milwaukee, Wis., designed to meet special handling prob-



Fork Lift Attachment

lems in shipping centers, industrial plants and construction work. It has a capacity rating of 1000 lb. at a 15-in. load center, can climb a 12 percent grade with full load, has a 61 in. turning radius, operates from a power-driven hydraulic pump, is 33 in. wide, weighs 1500 lb. carries 75 percent of loaded weight on front drive tires and has the fork lift unit easily interchanged with other front-end attachments.

New Vending Equipment

THE following installations of S & S ice vending equipment have been announced:

Kingman, Ariz.—Coca Cola Bottling Co.

Tracy, Calif.—Tracy Ice & Development Co.

Santa Cruz, Calif.—Regal Petroleum Corp.

Watsonville, Calif.—Regal Petroleum Corp.

Bicknell, Ind.—Bicknell Ice & Coal Co.

Oakland City, Ind.—J. H. Jones Ice Co.

Wichita, Kans. — Steffen Dairy Foods

Columbus, Miss. — Refuge Cotton Oil Co.

Reno, Nev.—Crystal Springs Ice Co.

Beacon, N. Y.—Bacu Ice, Inc.

Edmond, Okla.—Barnett Ice & Frozen Foods

Oklahoma City, Okla.—Lieberman Ice Co.

Klamath Falls, Ore.—City Ice & Supply Co.

Sewickley, Pa.—Sewickley Ice Co.

Plains, Tex.—Wolfenburger Ice Co.

Norfolk, Va.—H. Roper Ice Supply

Yorktown, Va.—Yorktown Ice & Storage Co.

Bremerton, Wash.—Ice Delivery Co.

Allied Chemical & Dye Forms New Divisions

EFFECTIVE June 1, 1952, Allied Chemical & Dye Corporation has announced the combination of the Nitrogen and Organic Chemicals Sections of its Solvay Process Division and the Sales Agency Department of its Barrett Division into a new organization to be known as the Nitrogen Division, Allied Chemical & Dye Corporation, with executive offices at 40 Rector Street, New York 6, N. Y.

Hugo Riemer is president of the new Nitrogen Division and M. F. Fogler and F. T. Techter are executive vice-presidents. Messrs. Riemer and Fogler were vice-presidents of Solvay and Mr. Techter occupied the same position with Barrett.

The formation of the Nitrogen Division consolidates the production, sales and distribution of many important Allied products into one organization. These products include Nitrogen Solutions, Anhydrous Ammonia, "Arcadian" Nitrate of Soda, "A-N-L" Nitrogen Fertilizer, Urea Products, Methanol, Formaldehyde, Nytron, and other products to be announced at an early date.

Sales of these products will be handled by essentially the same personnel that has handled sales of the same products heretofore: E. W. Harvey, director of sales; J. J. Porter, assistant director of sales; M. E. Hunter, sales manager, direct application materials; R. M. Jones, director of product development; W. H. Mortimer, sales manager, sulphate of ammonia; G. F. Reale, sales manager, industrial Nitrogen chemicals; G. W. Suggs, sales manager, fertilizer manufacture materials; A. W. Terry, sales manager, export; H. E. West, sale manager, organic chemicals.

The Nitrogen Division will operate and market the output of the giant Nitrogen plants at Hopewell, Va., and South Point, Ohio, the new $25,000,000 Nitrogen plant to be constructed near Omaha, Neb., and the new Organic Chemicals plant to be built at Orange, Texas, for the manufacture of ethylene oxide and ethylene glycol.

The Barrett Division and The Solvay Process Division of Allied Chemical & Dye Corporation will continue to function on other operations and products, formerly handled by these Divisions, which have not been transferred to the new Nitrogen Division.

Effective the same date the Solvay Process Division and the Solvay Sales Division will be consolidated and known as The Solvay Process Division, Allied Chemical & Dye Corporation. This Division will be responsible for production and sale of alkali, chlorine and related products. It will continue to sell the chlorine produced by the Nitrogen Division. A. B. Chadwick, now President of Solvay Process, will continue in that capacity and Carlton Bates will continue as vice-president in charge of operations. H. F. Merritt, now executive vice-president of Solvay Sales Division, will become vice-president of The Solvay Process Division in charge of sales. L. B. Gordon, now vice-president of Solvay Sales Division, will become a vice-president of The Solvay Process Division. No other change is contemplated immediately.

Effective June 9, 1952 the executive sales office will be moved from 40 Rector Street to 61 Broadway and consolidated with the Solvay Process executive office.

Worthington Reorganizes Air Conditioning Sales

THE Worthington Corporation announces that E. R. Michel has been named manager of direct sales of the air conditiong and refrigeration division. Formerly assistant manager of the division, he will be in charge of all air conditioning and refrigeration product sections located at the Harrison, N. J. plant, according to M. M. Lawler, assistant vice-president and manager of the air conditioning and refrigeration division.

Mr. Michel was formerly in charge of centrifugal refrigeration sales at Harrison, and was previously located in district offices in Chicago and Cleveland as a sales and application engineer. The air conditioning and refrigeration division has been reorganized and the following appointments have been made:

F. J. Watt, manager ammonia equipment section at Harrison, formerly assistant manager of air conditioning and refrigeration division.

J. Charles, Jr., manager petroleum and petro-chemical section at Harison, formerly in charge of the oil refinery section of air conditioning and refrigeration division.

P. J. McLeod, manager special process section at Harrison, application engineer in air conditioning and refrigeration division.

P. H. Shaw, manager packaged air conditioning section at Holyoke, formerly supervisor of distributor sales at Holyoke.

D. H. McCuaig, manager central station equipment section at Holyoke, formerly supervisor of engineering sales at Holyoke.

W. F. Bishop will continue as manager of distributor sales, with headquarters at Holyoke.

Sell more ice...
Do a better icing job

A LINK-BELT Ice Crusher-Slinger opens up new markets

Every shipper of perishable products is a potential customer if you have a Link-Belt Ice Crusher-Slinger. This modern method of top-icing helps bring a better price for the product at market, because spoilage is reduced.

Get all the facts about the Link-Belt Ice Crusher-Slinger. Capacities 15 to 60 tons per hour. Stationary or portable. Electric or gasoline driven.

Portable Link-Belt Ice Crusher-Slinger delivers snow-ice to tops of and between crates of celery. Profitable year 'round business can be built with a small investment.

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ICE CRUSHER-SLINGERS

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ESTABLISHED 1880
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FIFTH STREET & N. P. R. R.
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Used successfully in U. S. Govt. Jobs
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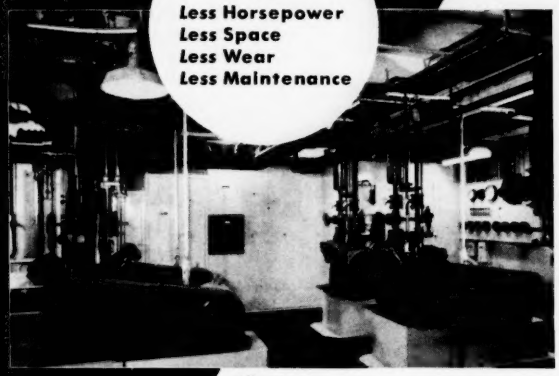
why Low Temperature Refrigeration ALWAYS COSTS LESS with CP Booster Systems

DO THE JOB with
Less Horsepower
Less Space
Less Wear
Less Maintenance



CP Booster System at storage plant of Golden State Co. Ltd., in San Francisco provides automatic refrigeration for 10 freezer and chill rooms.

Wherever temperatures are −15°F. or lower, multi-cylinder booster systems offer decisive advantages. Many plants are changing over to two-stage refrigeration even for temperatures as high as 0°F.

With a booster and 2nd stage compressor, compression ratios are lower; 2nd stage compressor runs cooler, under easier load. Units last longer, horsepower requirements are reduced, space and foundation needs are less. Temperatures as low as −60°F. can be maintained.

Choose CP Type K Boosters and Compressors and you get a system engineered to give you all the advantages of booster systems at *their best* . . . Ask for information!

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Mill Green Road, Mitcham Junction, Surrey, England

New Ice Vendors

THE Vivian Manufacturing Co. has recently installed Vivian-Serv ice vendors in the following plants: Leonard Ice & Fuel Co., Bethalto, Ill.; Robert Fritz, Mascoutah, Ill.; Sinn Ice & Soda Co., Marissa, Ill.; Lead Belt Ice & Fuel Co., Flat River, Mo.; Hafeli Ice & Fuel Co., Peterborough, N. H.

CATALOGS AND BULLETINS

New Link-Belt Book On Icing Equipment

MODERN methods of icing perishable commodities in transit and in storage are described in a new booklet on icing equipment, Book No. 2382, published by Link-Belt Company. Types of equipment for both bunker icing and top-icing are presented, ranging from self-propelled car icers for railroad icing docks to ice crushers and slingers used by growers, poultrymen, fishermen, dairymen, truckers, shippers and re-icing stations.

Link-Belt ice crusher slingers direct crushed snow-ice over and between tiers of containers, completely blanketing them for protection. Spoilage is reduced ot a minimum, and flavor and freshness are preserved. For leafy vegetables, for example, the temperatures produced by top-icing are close to ideal, according to the U. S. Department of Agriculture, and the moisture produced by the slowly melting ice prevents wilting and drying out.

By top-icing, dairies can deliver milk and other dairy products in top condition even at the end of extremely long routes. Crushed ice preserves poultry and gives it sales appeal.

Fishermen, too, now load their boats with crushed ice before putting out to sea. As the fish or shrimp are caught and stowed away, the ice is spread over them layer by layer.

Seven models of ice crusher slingers with capacities from 15 to 60 tons per hour are described, together with ice crushers, portable ice slingers and ice pulverizers.

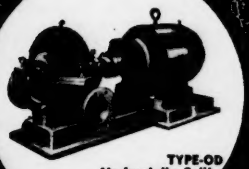
For large-scale icing or re-icing of railroad cars, the booklet gives full information, including schematic drawings, about the high capacity dock-type and rail-type car icers.

A TRADITION of INTEGRITY

— stands back of EVERY PUMP "by Aurora"

We recommend Type OD for municipal, industrial, institutional, etc. water supply— for handling condenser circulating water, liquids, chemicals and oils in paper mills, distilleries and refineries, irrigation, etc.

Write for BULLETIN 105



TYPE-OD Horizontally Split Case, Double Suction Single Stage Centrifugal Pump.

PUMPS "by Aurora"

Write TODAY for CONDENSED CATALOG "M"

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AURORA Always PUMPS

AURORA PUMP COMPANY

78 Loucks St., Aurora, Illinois

Bateman Automatic LOADER CRUSHER

CRUSHER ICE UNIT SAVES TIME AND LABOR COST!

One man can do the work of two . . . loader acting as the second man. By first loading the hopper slide with six 50-lb. blocks of ice, operator will not have to bother loading the crusher and can devote his full time to bagging ice. Storage bin under crusher will hold approximately 100-lbs. of ice.

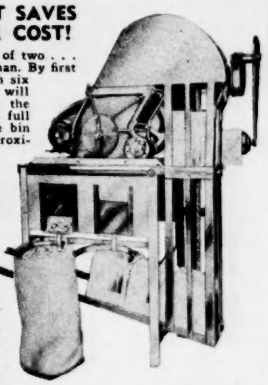
CRUSHER: Has five adjustments on the grate.

ELEVATOR: Is so timed as to allow each block of ice to be crushed before the next block enters crusher. Crusher is set to grind 175-lbs. a minute.

BAG HOLDER: A half ring holds the top of bag in place while bottom of bag sits on floor or platform.

SCREEN: A ¾" screen located under crusher will put the snow and fine ice into bin nearest elevator and larger pieces of nut or overrun size into other bin.

GUIDE OVER CRUSHER: The guide over the crusher that directs ice from elevator to crusher can be opened on the end to allow the operator to put scrap ice into crusher.



Any Bateman Model 50 Crusher can be installed on this unit. Height: 7'2"; length 4'; width 24".

LOADER CRUSHER $715.00
(¾ h.p. motor at prevailing price)
F.O.B. Mineral Wells, Texas.

Bateman — Write For Details

Ice Processing Equipment

Mineral Wells, Texas

Don't try to compete with yourself by using that machine in your plant which is too small for the job! Scan page 79 for the things you need and sell your small equipment through a want ad.

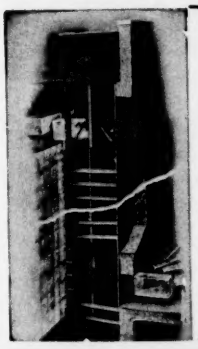
HELP your COMPRESSORS!

RUPPRIGHT'S ROTARY ROOF COOLER

Handles sun load with spent cooling water.

Write for literature to: Box 6795-1

Los Angeles 22, Cal.



CEMCO

Double Gig Ice Hoist
Fast - Sturdy -
Dependable -

Send for details

THE CAPITAL ELEVATOR & MFG. CO.
424 W. Town St.
Columbus 8, Ohio

DIMCO CAST ALUMINUM FIN EVAPORATING COIL

★ Saves Space
★ Saves Weight
★ Saves Cost

CAN BE USED WITH ANY REFRIGERANT

Write for descriptive folder

DETROIT ICE MACHINE COMPANY
2615 Twelfth St., Detroit 16, Mich.

DIMCO Evaporators in a Frozen Food Storage Room at Great Lakes Terminal Warehouse, Toledo, Ohio. A typical installation facilitating palletizing.

Remember the name **Armour** for

Ammonia when you want it

where you want it and **Fast...**

Wherever you are, whatever your ammonia needs, there's an Armour stockpoint within reach of your telephone. If you are not located in one of the cities listed below—call any Armour sales office.

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You can depend on Armour's Ammonia and Service

ARMOUR *Ammonia Division*

Armour and Company • 1355 W. 31st Street • Chicago 9, Illinois

The Link-Belt Master car icer is a self-propelled machine traveling on rails at ground level, eliminating conventional icing dock. Servicing a train of refrigerator cars on each side of machine, it ices and salts bunkers and delivers crushed ice for top icing. A conveyor between the machine and train of cars delivers ice from storage to the master icer. One man controls operation of both car icer and dock ice conveyor.

The dock-type icer also is self-propelled. Operated by one man, it services a train of refrigerator cars on each side of the dock, icing and salting bunkers in one operation. It can also be equipped to do top-icing.

Neoprene Treated Paper

NEOPRENE, a "chemical rubber" product is described in a bulletin issued by the Rubber Chemicals Division of the du Pont Company. It is synthesized from coal, limestone, and salt, and was first produced commercially in 1931. Added to paper, it results in a great improvement in wet tensile, making it more serviceable under wet or humid conditions and in the packaging of wet materials. It improves scuff resistance and resistance to abrasive wear.

The 16-page bulletin is fully illustrated, with diagrammatic construction details, pictures of the product, and a table showing applications of Neoprene treated paper.

Bulletin on Lift Trucks

COMPREHENSIVE information on current models of lift trucks is given in Bulletin 5110, issued by Barrett-Cravens Company, Chicago, Ill. These are available with either electric drive or hand operated, in two standard widths. The narrow J model is intended for use for loads up to **36** inches wide and **2,500** pounds in weight. The wider J K model is designed for bulky loads up to 48 inches wide.

Bulletin Describes Air Cooling Units

A NEW Ice and Frost bulletin of The Frick Company, Waynesboro, Pa., describes and illustrates air cooling units for use with ammonia or brine refrigeration. A number of installations are pictured and data is given on the Frick air cooling unit.

Palletized Tote-Box

A FOUR-PAGE brochure issued by The American Box Co., Cleveland, Ohio, describes a new type palletized tote-box, wirebound, collapsible, and easy to handle. It has a full-length wood cleat, steel stapled construction, with hard surface fibreboard panel. Shippers are invited to send product for a free sample packing and quotation.

THE BUYERS DIRECTORY

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ABSORBERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

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AIR COMPRESSORS
Frick Co., Waynesboro, Pa.

AIR CONDITIONING EQUIPMENT
Carrier Corp., Syracuse, N. Y.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Niagara Blower Co., New York, N. Y.

AMMONIA COMPRESSOR VALVES
Frick Co., Waynesboro, Pa.

AMMONIA COMPRESSORS
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Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
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Howe Ice Machine Co., Chicago, Ill.
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Vogt Machine Co., Henry, Louisville, Ky.

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AMMONIA FLOAT VALVES
Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesvoro, Pa.
Phillips & Co., H. A., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

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du Pont, Polychemicals Dept., Wilmington, Delaware

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Kehoe Machinery Co., Inc., R. F., West Englewood, N. J.
National Pipe Bending Co., New Haven, Conn.
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Vogt Machine Co., Henry, Louisville, Ky.

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Vogt Machine Co., Henry, Louisville, Ky.

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Frick Co., Waynesboro, Pa.
Phillips & Co., H. A., Chicago, Ill.
Rex Engineering & Sales Co., Oklahoma City, Okla.

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Union Bag & Paper Corp., New York, N. Y.

BAGS, WATERPROOF PAPER
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Union Bag & Paper Co., New York, N. Y.

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Vogt Machine Co., Henry, Louisville, Ky.

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Roots-Connersville Blower Corp., Connersville, Ind.

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Vogt Machine Co., Henry, Louisville, Ky.

BOILER TUBES
Byers Co., A. M., Pittsburgh, Pa.

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Don't Waste Tons!
Maintain Peak Refrigeration Efficiency with
PHILLIPS FLOAT CONTROLS

SERIES 300 PHILLIPS FLOAT CONTROLS
- SERVICEABLE—No pump down needed to inspect or renew cartridge.
- ADAPTABLE to most types of flooded evaporators
- COMPACT—mounts directly in surge drum

Phillips Float Controls are available in capacities of 1 to 1000 tons for "Freon" and 1 to 2000 tons for ammonia. Consult with Phillips engineers on applications of Phillips Float Controls for your present equipment or specifications on new units. Just call on us . . . we'd like to help.

Write for Catalog

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3255 W. CARROLL AVENUE • CHICAGO 24, ILLINOIS

Representatives: The C & S Equipment Co., 2103 S. San Pedro St., Los Angeles, Cal.
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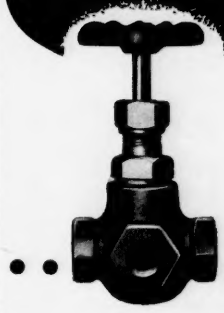
SHANK REFRIGERATION PRODUCTS
TOP CONSTRUCTION!



3-WAY DUAL SHUT-OFF VALVE
For use where Refrigeration Codes require dual relief valve installations. Stainless steel stem. Indicator plate on hand wheel shows position of valve shut off. Completely rust-proofed.

RELIEF VALVES
For Ammonia and Freon. One piece body design—rustproof finish. Internal construction—stainless steel—will not corrode. Positive relief action. Pressures from 75 to 400 lbs.

See your jobber—or write us for prices.

CYRUS SHANK CO.
629 W Jackson Blvd Chicago 6, Ill

New ACME PROTECT-A-VALVE

. . . the "Storm Door" for Gas Masks

Now Acme introduces an auxiliary valve to solve the problems of frozen valves in sub-zero weather, and curled valves due to rubber solvents. Serving much the same as a storm door serves the home, the Protect-A-Valve is designed for use with the Acme No. 6 face piece—making it safe for use in temperatures as low as 50 degrees below zero. Write for complete details on this approved Acme development to overcome hazards of rubber-solvent atmospheres and *to be ready for next winter's freezing problems.*

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DANDUX ICE BAGS STAND UP WITHOUT CRUMPLING

- STIFFER
- STRONGER
- EASIER TO USE
- METAL BOTTOMS WON'T BUCKLE, PULL OUT, FLAKE, RUST OR PEEL!

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(See Ice Making and Refrigerating Machinery)

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Voss, Inc., J. H. H., New York, N.Y.

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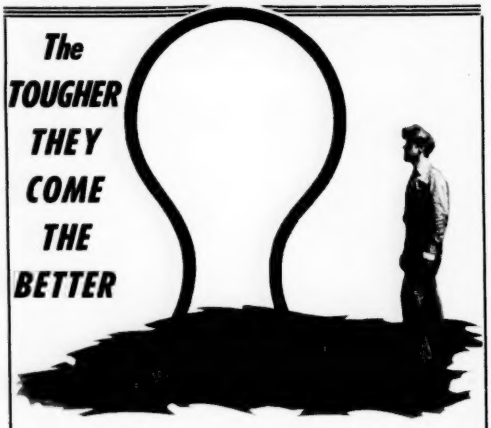

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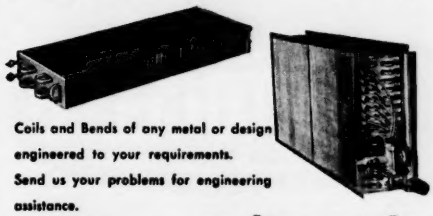

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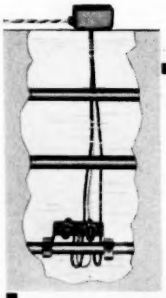

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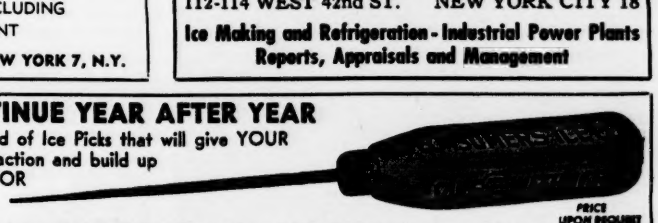
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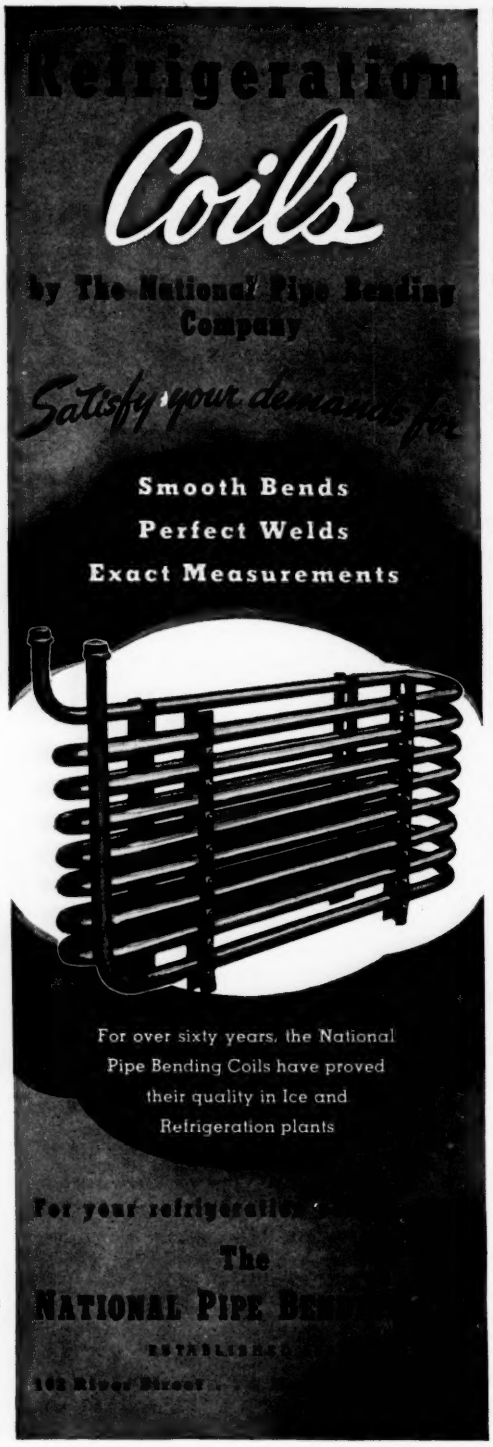

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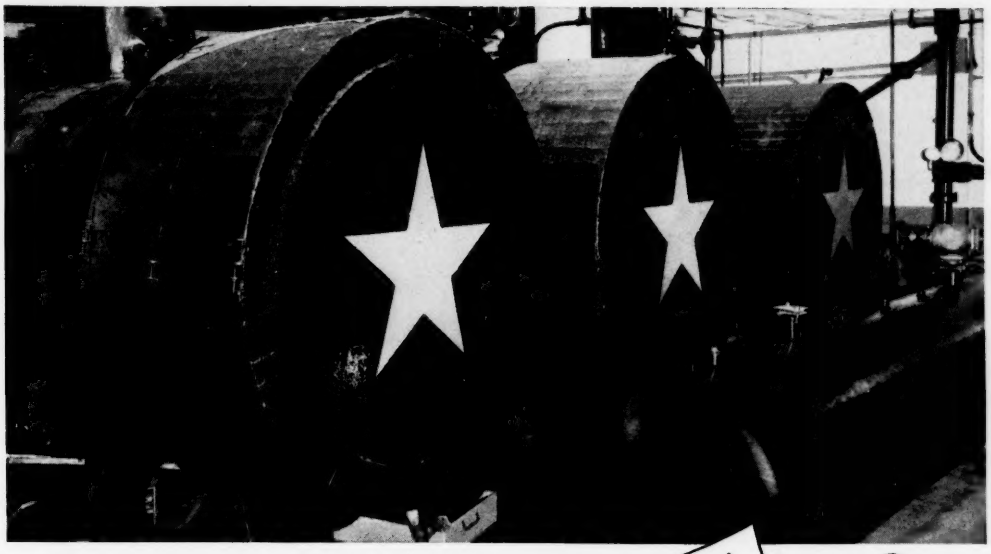

Can you guess the age of this insulation?

A good insulation job never looks its age. The cork lagging on these brine coolers, for example, seems almost new. It is still dry, highly efficient, and shows no signs of deterioration. Yet this insulation was installed in 1912—40 years ago!

These tanks are part of the equipment at the Memphis Cold Storage Warehouse Company. In that warm, humid climate, 6″ of Armstrong's Cork Lagging has held temperatures of 12° below zero at remarkably low refrigerating costs. The lagging has proved its superior moisture resistance despite the wide temperature differential outside and inside the vessels. The only maintenance has been occasional inspection of the bands and periodic painting with asphalt paint.

It takes the right combination of sound engineering, top-quality materials, and expert application to give that kind of service. But when Armstrong's Corkboard, Lagging, or Cork Covering are used, records like this aren't unusual. Today, hundreds of cork installations across the country are performing efficiently after 20, 30, and even 40 years of service!

Low-temperature insulation is a long-term investment. That's why it pays to contact Armstrong whenever you're planning any insulation job. We offer a complete line of the finest insulating materials and the skilled workmen to apply them properly. You get an insulation job that gives years of economical, trouble-free service. For further information, just contact your near-by Armstrong office or write direct to Armstrong Cork Company, 4507 Concord St., Lancaster, Pa.

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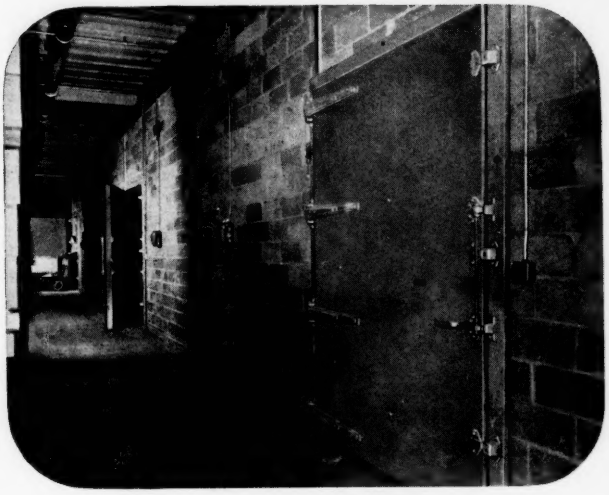
2. Integrity — a reputation for quality work and for prompt settlement of any justified complaints.
3. Technical ability — experience, plus technical and research staff to complete the work in accordance with best practices.
4. Manpower resources — trained supervisors and workmen able to handle any contract efficiently.
5. Efficiency — ability to handle accurately things like accounting, tax provisions, insurance, and workmen's compensation.

You get all these with an Armstrong Contract

Armstrong's INDUSTRIAL INSULATIONS
For temperatures from 300° below zero to 2800° F.

JAMISON doors speed food handling at Grand Union Warehouse

Installation at New Warehouse of Grand Union Company, Carlstadt, New Jersey.



WIDE OPENING FOR EASY HANDLING OF HAND TRUCKS

Exclusive Jamison Adjustoflex Hinges equipped with ball bearings, provide support with easy movement for the 6′x 9′ Door.

AMPLE HEIGHT FOR PASSAGE OF ELECTRIC TRUCKS

Monopanel construction of door gives greater rigidity and maintains seal.

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HAGERSTOWN, MARYLAND, U. S. A.

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